# Railway Maintenance Engineer

Volume 18 — CHICAGO—JULY, 1922—NEW YORK — Number 7

RAILWAY MAINTENANCE ENGINEER
Entered as second-class matter June 23, 1916, at the post office at Chicago, Ill., under the Act of March 3, 1879. Published Monthly by Simmons-Boardman Publishing Company at 608 S. Dearborn St., Chicago. Subscription price, United States, Canada and Mexico, $2.00 a year; foreign countries, $3.00 a year.

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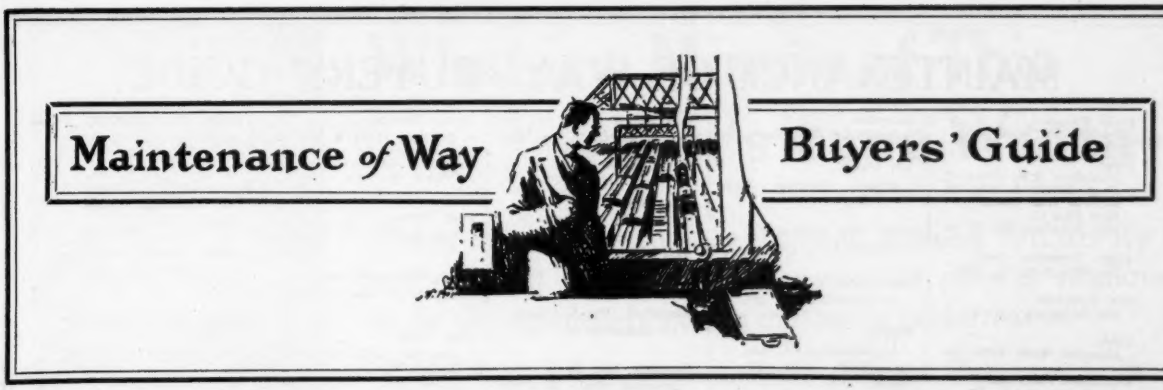


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Massey Concrete Prod. Corp.

**Switch Stands.**
Wm. Wharton, Jr., & Co.

**Switchstands and Fixtures.**
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Fairbanks, Morse & Co.
Ramapo Iron Works.
Weir Frog Co.

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Fairbanks, Morse & Co.

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Air Reduction Co., Inc.

**Torches, Blow Combination.**
Air Reduction Co., Inc.

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Air Reduction Co., Inc.

**Torches, Welding and Cutting.**
Air Reduction Co., Inc.

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Weir Frog Co.

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Warren Tool & Forge Co.

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Ruberoid Co., The.

**Washers.**
Diamond State Fibre Co.

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American Valve & Meter Co.

**Waterproofing.**
Ruberoid Co., The.

**Welding, Oxy-Acetylene.**
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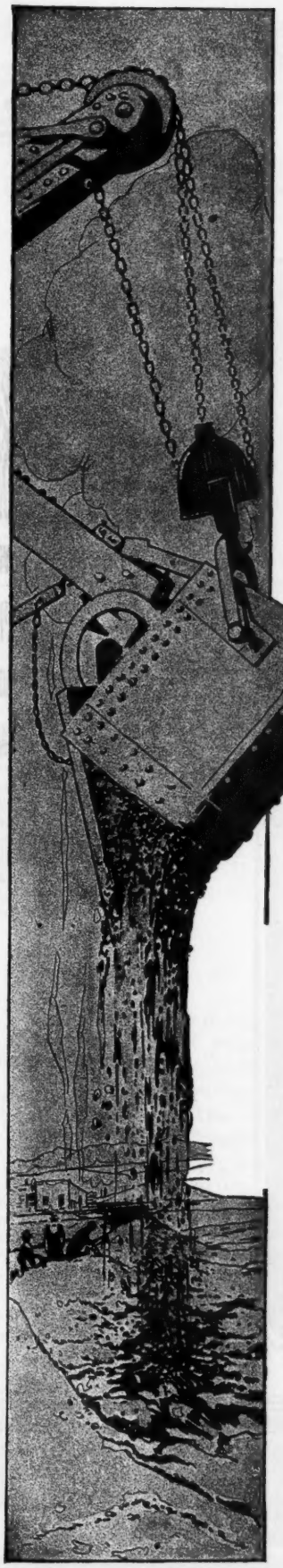
**Wheels (Hand and Motor Car).**
Fairmont Gas Engine & Ry. Motor Car Co.
Woolery Machine Co.

**Wire.**
Armco Culvert & Flume Mfrs. Assn.

**Wire Rope.**
Fairbanks, Morse & Co.

**Wood Preservative.**
International Creosoting & Construction Co.

**Zinc Chloride.**
New Jersey Zinc Co.



# What is a Minute of This Outfit's Time Worth—

Where minutes are money there is nothing but ability to perform that counts. Any question of price is swallowed up by the immensely bigger matter of performance.

"K & J" All Steel Automatic Air Dump Cars are built to service equipment of this kind. "K & J" Cars will service such equipment better than any other, as their records of the last ten years will show.

Rapidity of operation is an outstanding feature of "K & J" Cars. "K & J" Cars are operated from stored air and each car is an independent operating unit in itself.

A few seconds covers the entire operation of unlocking, dumping, righting back and re-locking either a single car or any number of connected "K & J" cars. Two simple levers control the entire operation.

In emergencies or in daily steam shovel operation, it is not the dollar of bargain that counts—but ***ability to perform.***


"K & J" All Steel Automatic Air Dump Cars are fully patented under issues as follows:

| | |
|---|---|
| 872,057—Nov 26th, 1907. | 1,034,418—Aug. 6th, 1912. |
| 907,218—Dec. 22nd, 1908. | 1,057,413—Apr. 1st, 1913. |
| 921,376—May 11th, 1909. | 1,178,208—Apr. 4th, 1916. |
| 973,229—Oct. 18th 1910. | 1,236,368—Aug. 7th, 1917. |
| 1,029,247—June 11th, 1912. | 1,281,508—Oct. 15th, 1918. |

Other patents pending.

***"K & J" All Steel Automatic Air Dump Cars are made in five capacities, 12, 16, 20, 25, and 30 cu. yds. level full.***

## The Kilbourne & Jacobs Mfg. Co.

**Columbus, Ohio, U. S. A.**

**New York, 120 Broadway**

TRADE MARK
K&J
REG. U.S. PAT. OFF.


## WAR DEPARTMENT

## SELLING PROGRAM

# July-August

**July 6—Q. M. SUPPLIES—San Antonio, Tex., Auction. For catalog write, Q. M. S. O., Ft. Sam Houston, Tex.**

**July 7—Q. M. SUPPLIES—Washington, D. C., Auction. For catalog write, Q. M. S. O., 1st Ave. & 59th St., Brooklyn, N. Y.**

**July 11—AIR SERVICE SUPPLIES—Buffalo, N. Y., Auction. For catalog write, C. O., Curtiss-Elmwood Depot, Buffalo, N. Y.**

**July 12—Q. M. SUPPLIES—San Francisco, Calif., Auction. For catalog write, Q. M. S. O., Gen. Intermed. Depot, Ft. Mason, San Francisco, Calif.**

**July 13—Q. M. SUPPLIES—Omaha, Neb., Auction. For catalog write, Q. M. S. O., 1819 W. Pershing Rd., Chicago, Ill.**

**July 20—Q. M. SUPPLIES—Columbus, O., Auction. For catalog write, Q. M. S. O., 1819 W. Pershing Rd., Chicago, Ill.**

**July 25—Q. M. SUPPLIES — Camp Jackson, S. C., Auction. For catalog write, Q. M. S. O., Candler Warehouse, Atlanta, Ga.**

**July 28—Q. M. SUPPLIES—Philadelphia, Pa., Auction. For catalog write, Q. M. S. O., 1st Ave. & 59th St., Brooklyn, N. Y.**

**Aug. 1.—Q. M. SUPPLIES—Schenectady, N. Y., Auction. For catalog write, Q. M. S. O., 1st Ave. & 59th St., Brooklyn, N. Y.**

**Aug. 3—Q. M. SUPPLIES—Camp Grant, Ill., Auction. For catalog write, Q. M. S. O., 1819 W. Pershing Rd., Chicago, Ill.**

**SEND FOR CATALOG**

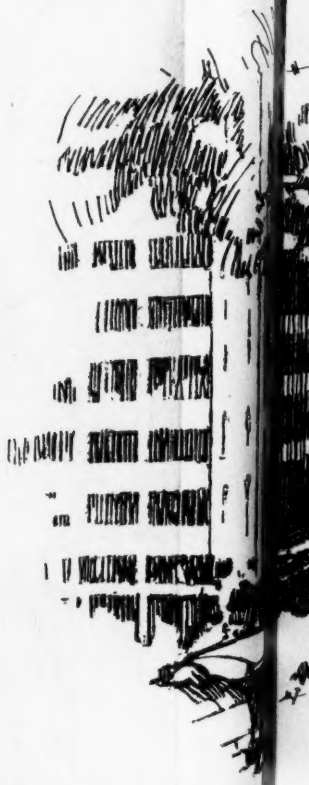
In checking over the accompanying program of sales, note that the designation "Q. M. SUPPLIES" is a cloak to a list of 65,000 commodities. Not all of this great number is included in each sale, of course. Nor will the buyer in the railway field be interested in all of the 65,000 items. Your individual needs govern your purchases. The sales listed will present some or all of the following commodities:

Commissary supplies, motor vehicle parts, hardware, hand and machine tools, office supplies, hoists, pipe, boilers, power plants, motors, electrical wiring, tracks, ties, bolts, etc.; wire cable.

Sales listed as "AIR SERVICE SUPPLIES" will offer from time to time:

Machine and hand tools, scrap steel, iron, bronze, aluminum and brass; oils and lubricants, welding outfits, grinding compounds.

**SEND FOR CATALOG**

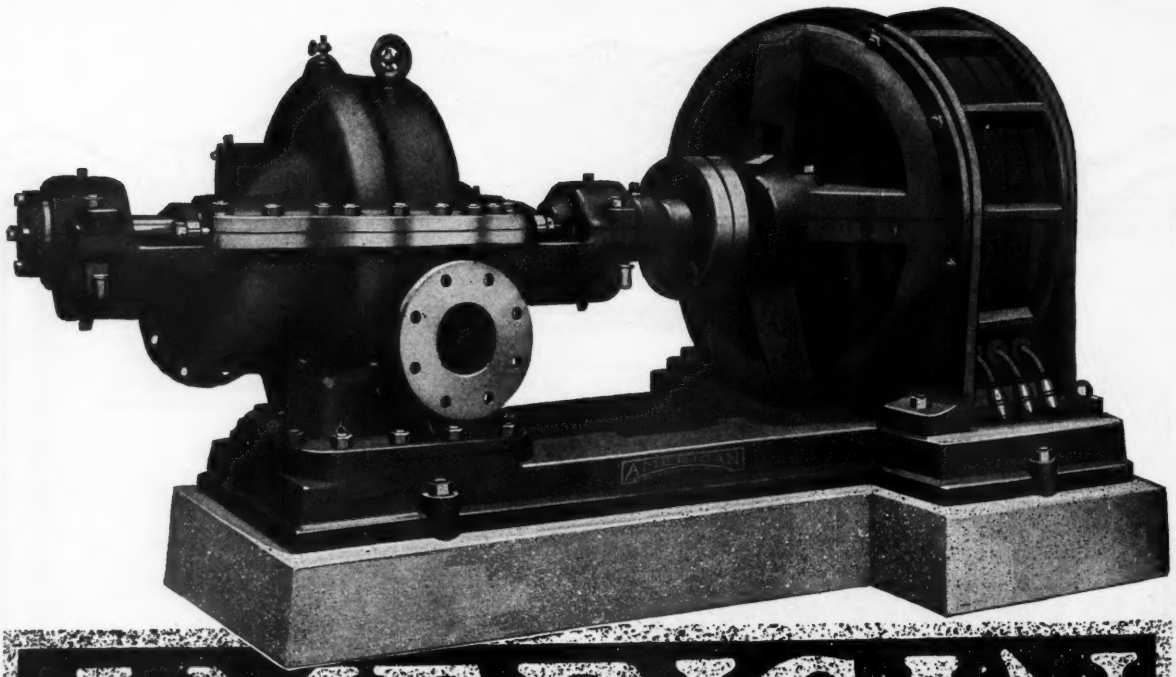


## *By Negotiation*

During July and August, at Chicago, Ill., the War Department is conducting one of the greatest sales of machine tools it has ever held. A great variety, and large quantities of machines are offered. Send for full information to Chairman, Chicago District Ordnance Salvage Board, 7400 South Ashland Ave., Chicago, Ill.

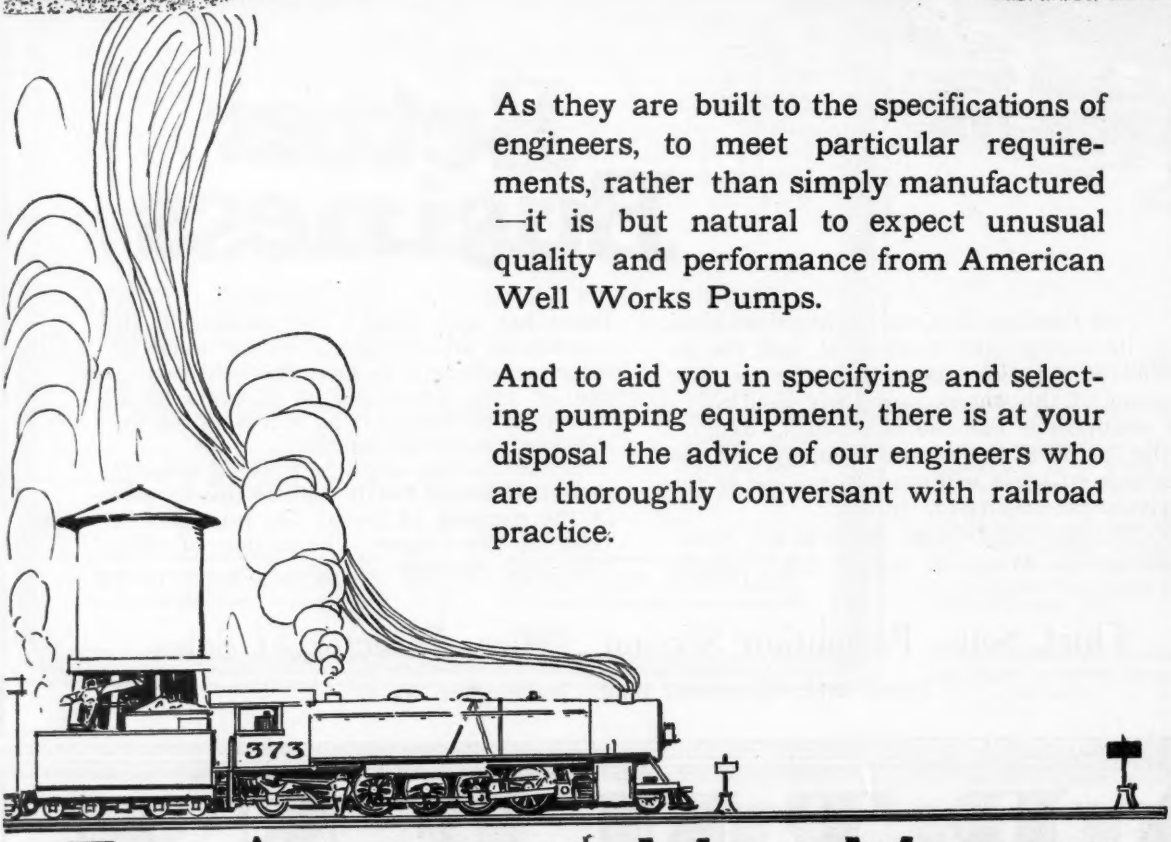
***The Government reserves the right to reject any or all bids.***

WAR DEP



# AMERICAN

TRADE MARK REGISTERED U.S. PAT. OFFICE




As they are built to the specifications of engineers, to meet particular requirements, rather than simply manufactured—it is but natural to expect unusual quality and performance from American Well Works Pumps.

And to aid you in specifying and selecting pumping equipment, there is at your disposal the advice of our engineers who are thoroughly conversant with railroad practice.

## THE AMERICAN WELL WORKS

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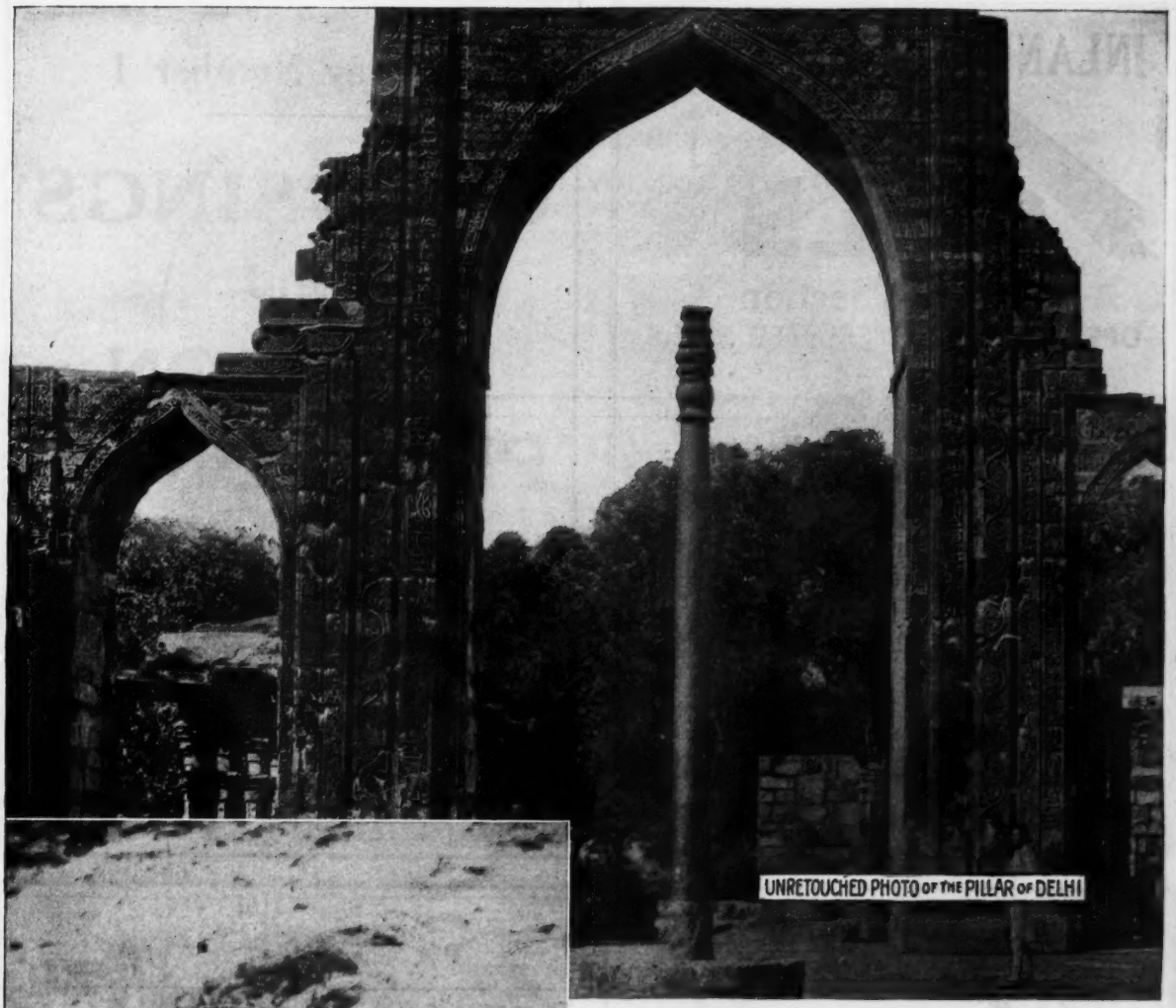
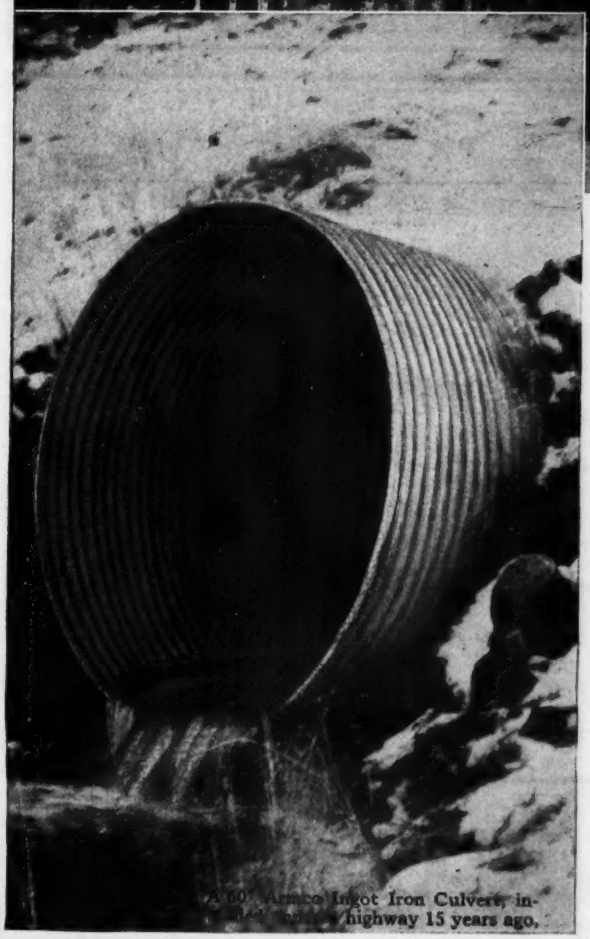
AURORA, ILL.

Chicago Office
FIRST NATIONAL BANK BLDG.





60" Armco Ingot Iron Culvert, in- highway 15 years ago.

# Enduring—because made of PURE Iron

For sixteen centuries the iron pillar at Delhi has looked down unchanged on changing civilizations.

Torrential rains and scorching Indian suns have failed to mar this age-old structure. The material is *pure* iron—the impurities hammered out laboriously, minute quantities at a time, by the ancient Hindus.

The modern counterpart of this ancient iron is Armco Ingot Iron, possessing the same purity, and promising equal permanence. Already hundreds of

## ARMCO CULVERTS

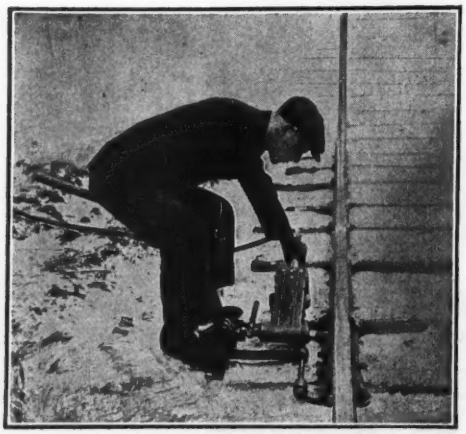
like the one pictured have been under our highways and railroads for a generation and show scarcely a sign of use.

There is a manufacturer in nearly every state, and in Canada, making genuine rust-resisting ARMCO CULVERTS and other products of Armco Ingot Iron such as flumes, siphons, tanks, road signs, roofing. Write for full information and nearest shipping point on products in which you are interested.

**ARMCO CULVERT & FLUME MFRS. ASSN.**
215 NORTH MICHIGAN AVE. CHICAGO

ARMCO Ingot Iron

A "Little David" Portable Grinder operated from a Tie Tamper Car, grinding switch points.



This air operated rail drill will drill a ⅞" hole through a web in 25 seconds.

# "IMPERIAL" Pneumatic Tamping Outfits Save Labor on Many Jobs

Although the most important use of "Imperial" Tamping Outfits is the tamping of ballast, they are adaptable to numerous other operations which can be performed with labor saving air tools.

Often the Tie Tamper Compressor Cars supply air power to pneumatic drills for boring holes in ties and rails, running down screw spikes and lag screws, tightening bolts, railbonding, etc.

They supply the air for operating portable grinders for grinding rails and switch points, to riveting and chipping hammers, rock drills, paint sprays, sand blast nozzles and many other pneumatic devices resulting in pronounced savings over hand methods.

**INGERSOLL-RAND COMPANY**
**11 Broadway, New York**
*Offices in all large cities*

# Ingersoll-Rand

172-TT


# Railway Maintenance Engineer

Vol. 18 July, 1922 Number 7


## TABLE OF CONTENTS



**WOULD YOU LIKE TO KNOW**

When the first steam shovel was used?

If Douglas fir is stronger than yellow pine?

How double track trusses were placed on single track piers?

How to adjust a spark plug?

How to load concrete pipe on cars?

Answers to these and other practical questions will be found elsewhere in this issue.




Published on the last Thursday preceding the date of issue by the

**Simmons-Boardman Publishing Company, Transportation Building, Chicago, Ill.**

NEW YORK: Woolworth Building CLEVELAND: 4300 Euclid Ave. LONDON, England: 34, Victoria St., Westminster, S. W. 1
CINCINNATI: First National Bank Building WASHINGTON: Home Life Bldg. Cable Address: Uraslgmec, London
NEW ORLEANS: Maison Blanche Annex

(With which is incorporated the Engineering and Maintenance of Way Edition of the *Railway Age* and *Railway Engineering and Maintenance of Way.*)

Entered at the postoffice at Chicago, Ill., as mail matter of the second class.

Request for change of address should reach us two weeks before the date of the issue with which it is to go into effect. It is difficult and often impossible to supply back numbers to replace those undelivered through failure to send advance notice. In sending us change of address please be sure to send us your old address as well as the new one.

Subscription price in the United States, Canada and Mexico $2.00 per year; foreign countries $3.00. Single copies, 35 cents. Foreign subscriptions may be paid through our London office (34, Victoria Street, S. W. 1) in £-s-d.

WE GUARANTEE, that of this issue 7,000 copies were printed; that 6,194 of these copies were mailed to regular paid subscribers, 57 were mailed to advertisers, 30 were mailed to employees and correspondents, and 719 were provided for new subscriptions, samples, copies lost in the mail and office use; that the total copies printed this year to date were 48,850, an average of 6,979 copies a month.

*Railway Maintenance Engineer is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulation (A. B. C.)*

# Uniformity Throughout

*The tie that lasts longest is least expensive*

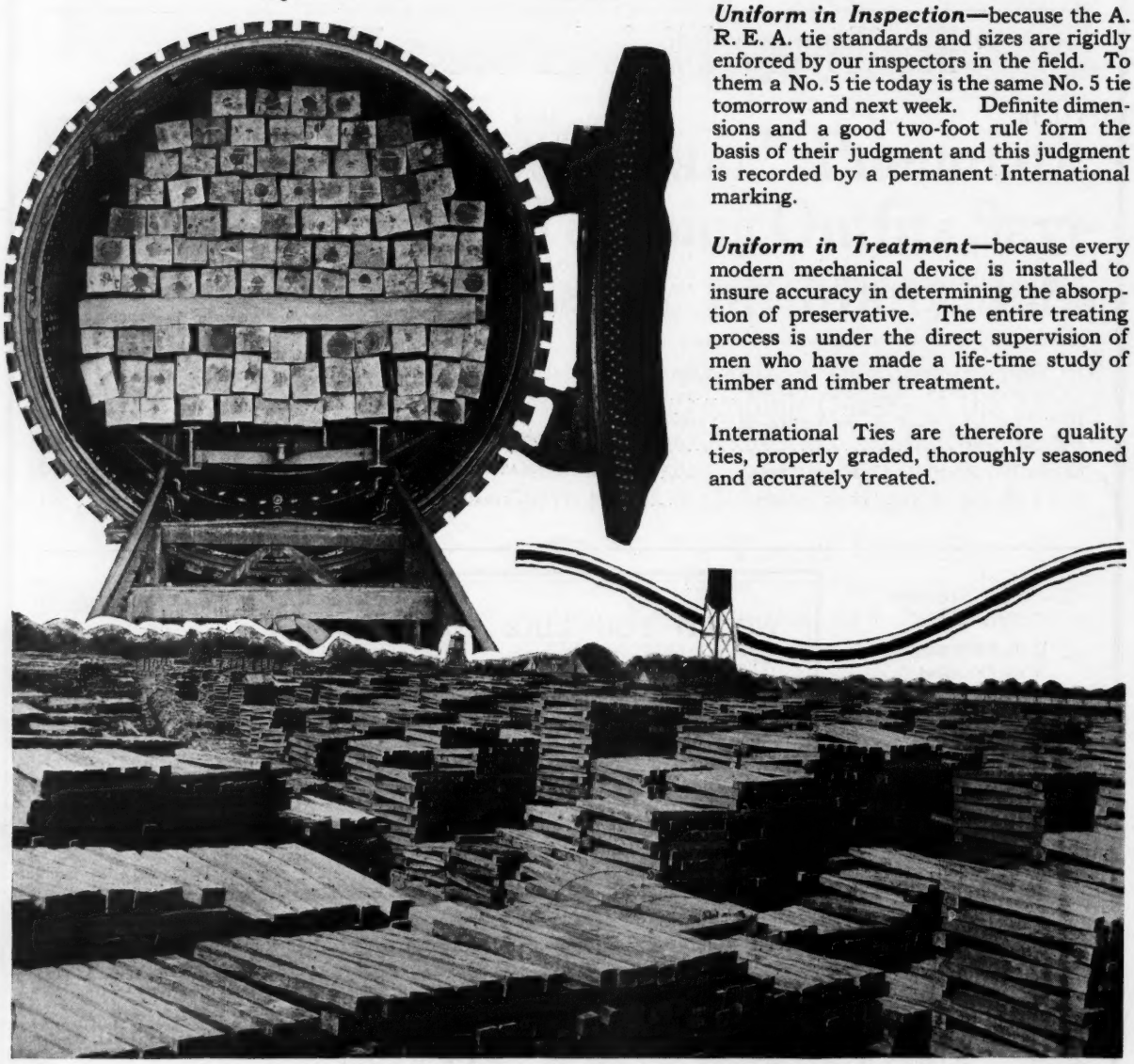
INTERNATIONAL Ties set a standard of uniformity in production, in inspection and in treatment.

***Uniform in Production***—because our producers are experienced in the characteristics of the timber in this territory. To them, red oak is always red oak and white oak always white oak. They have been educated to produce ties in strict accordance with A. R. E. A. specifications.

***Uniform in Inspection***—because the A. R. E. A. tie standards and sizes are rigidly enforced by our inspectors in the field. To them a No. 5 tie today is the same No. 5 tie tomorrow and next week. Definite dimensions and a good two-foot rule form the basis of their judgment and this judgment is recorded by a permanent International marking.

***Uniform in Treatment***—because every modern mechanical device is installed to insure accuracy in determining the absorption of preservative. The entire treating process is under the direct supervision of men who have made a life-time study of timber and timber treatment.

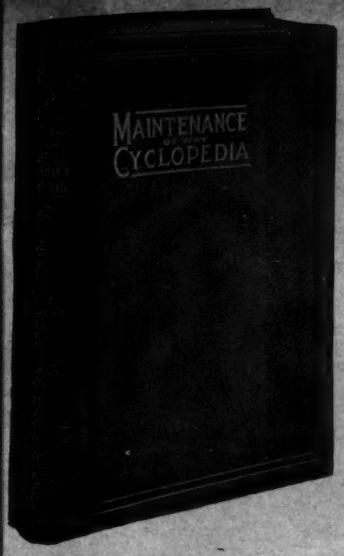
International Ties are therefore quality ties, properly graded, thoroughly seasoned and accurately treated.



## International Creosoting & Construction Co.

**General Office—Galveston, Tex.**

**Plants: Texarkana, Texas Beaumont, Texas Galveston, Texas**




# A "Handy Kit" Ready for Any Emergency

## The Maintenance of Way Cyclopedia

### Each of Its Eight Sections is a Complete Working Tool

MAINTENANCE men everywhere are using this Cyclopedia in order to build a firm foundation for the present and the future. One chief engineer says, "It becomes a greater asset as you accustom yourself to use it for ready reference"; another, "It is used every day and will continue to be"; while a Division Engineer states, "The biggest ten dollars' worth I ever got in my life."

THE volume gives the necessary background of authoritative knowledge and covers the maintenance of way field from A to Z. Compiled with the aid and co-operation of the American Railway Engineering Association, the Railway Signal Association and other related organizations, it gives their recognized rules and practices. There are over 2,500 illustrations presenting a complete picture of maintenance of way devices, materials and methods of use, well arranged and thoroughly indexed.

THE value of the Maintenance of Way Cyclopedia to you cannot be calculated in terms of money. The more you use it, the more it is worth to you in your present position or in preparation for one higher up.


Sample page from Track Section (very much reduced in size).

## 8 Valuable "Tools" Ready for Your Immediate Use

1. **Track Section—210 Pages.**
   Track laying methods and appliances as well as those used in maintenance work are described and defined. Hundreds of drawings, photos and sixteen large folding plates showing switch layouts, etc., are included.

2. **Bridge Section—77 Pages.**
   Types of bridges and methods used in their construction are described and illustrated. A. R. E. A. specifications for bridge design and erection are given.

3. **Building Section—74 Pages.**
   Various types of railway buildings—passenger stations—coaling stations—engine and freight houses, etc., are described and illustrated by photographs of actual buildings and drawings.

4. **Water Service Section—47 Pages.**
   Appliances and tools needed for water service work are described and pictured in a comprehensive manner.

5. **Signal Section—120 Pages.**
   Principles and apparatus used in modern railway signaling are covered. Signal systems are illustrated in detail.

6. **Wood Preservation Section—24 Pages.**
   Treats the subject fully including a key for the identification of woods as well as specifications for different preservative treatments.

7. **General Section—77 Pages.**
   Information regarding construction and camp equipment as well as a large number of tools and devices which are used in more than one of the foregoing sections is given.

8. **Catalog Section—240 Pages.**
   Describes in a specific manner various machines and appliances used in maintenance work and where they may be obtained.

All the subjects treated in the several sections are listed alphabetically in a **General Index.** The **Catalog Section** contains, in addition to the alphabetical **Trade Name** and **Classified Indexes,** detailed descriptions of products you are interested in.

## Over $40 Worth of Maintenance Knowledge for $10

The Cyclopedia is divided into 8 sections which are described above. If these 8 sections, each one of which is complete in itself, were published separately the cost would be prohibitive, to some, owing to the vast amount of time and research necessary. At the very lowest possible estimate these eight books would have to sell at an average price of $5.00 each. And you have a chance to obtain them, bound in one readily accessible volume, at a cost of little over $1.00 apiece!

## At Your Service for Only $2

BETTER THAN THAT, you are at liberty to examine the Cyclopedia for 10 days FREE. You need send no money until you have convinced yourself of the value of the book. Then, if you do not care to pay the amount in full, send us $2.00 for a first payment and $2.00 at monthly intervals until the volume has been paid for. Just fill out the post card, specify the binding you prefer and mail to us. We will see that a copy is there to serve you immediately.

## Tear Off the Card Below—Mail It TODAY

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**34 Victoria St. Westminster, S. W. 1.**

**London, England**

***"The House of Transportation"***

### FREE EXAMINATION POST CARD

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Book Service Dept.,
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Cross off the binding you do NOT desire.

Please send a copy of the MAINTENANCE OF WAY CYCLOPEDIA, without expense to me, on 10 days' approval. If I decide to keep the book I will send you $2.00 as a first payment and $3.00 a month thereafter until my account is paid. Please send

(Sent on approval to retail purchasers in the United States only.) } Durable Buckram Binding.....$10.00
} Full Leather Binding..... 15.00

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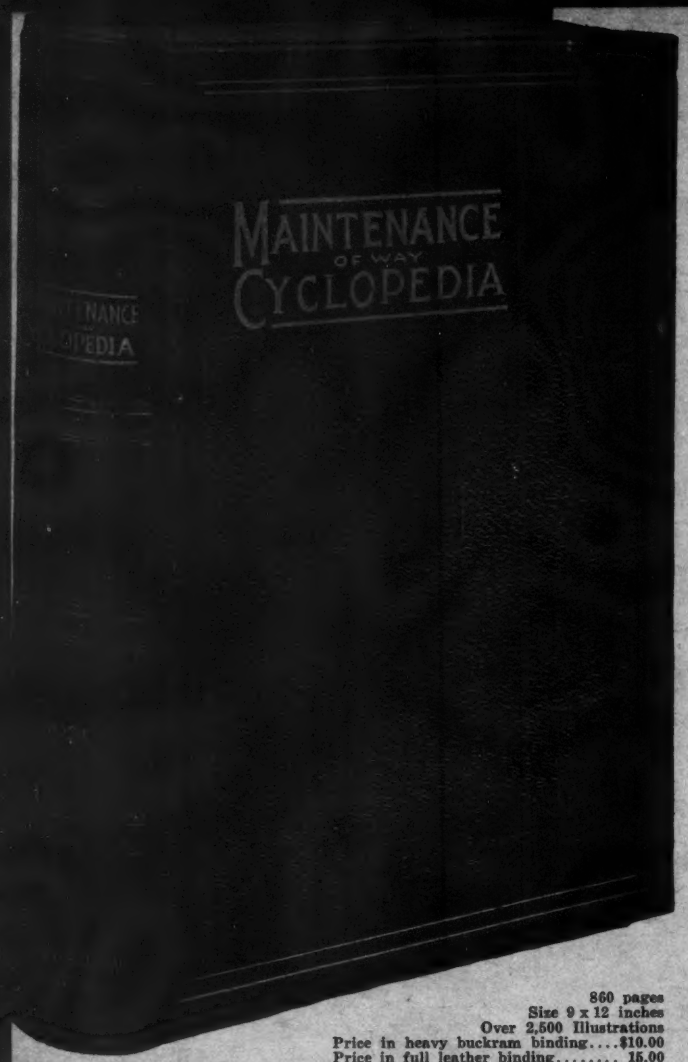


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# Railway Maintenance Engineer

**The Antiquity of the Steam Shovel**

It is a matter of common realization among railway men that early railway construction in this country was done very largely with the aid of the pick and shovel, and even during the recent war period there were times when emergency work demanded recourse to the primitive equipment of the past. On the other hand, there are few men in railway service today who can recall when they first heard of the steam shovel. Insofar as memory goes, the steam shovel has always been a part of the necessary equipment of railway construction and the accuracy of this impression is borne out by the remote date of its invention. As demonstrated elsewhere in this issue, the modern excavator is but a development of a machine designed within 10 years of the time that the first steam locomotive was operated in the United States. But what is still more strange, is the fact that this primitive machine bears all the characteristics of the steam shovel of today and that in the continual improvement that is being made in modern excavating equipment but little change has been effected in the fundamental principles embodied in the original device invented by William Otis.

**Is the Eight Hour Day Enough?**

Through changes made by the United States Railroad Labor Board in the national agreements with the maintenance of way employees on December 14, 1921, it is now possible for maintenance of way forces to work up to ten hours on straight time, but in spite of this fact, some of the railroads are still adhering to the eight-hour day. In view of the fact that there are portions of the country at the present time where a labor shortage is appearing, it is pertinent to inquire whether it would not be advisable to take advantage of the opportunity for the longer working day for at least the duration of the more favorable season for conducting maintenance of way work. The longer day will increase the amount of work which can be done with the force available, it will add to the daily wage and thereby increase the attractiveness of the employment and it will also reduce the relative proportion of dead time spent in traveling to and from the work, etc. However, if it should be found that ten hours is a longer time than is favored by most of the men it is possible that the nine-hour day will be received with favor. But whether the working day is eight, nine or ten hours, it is well to keep in mind that changing conditions require varying treatment. It is well, therefore, to review conditions from time to time to ascertain whether the prevailing plan is the best one.

**Don't be too Arbitrary.**

Two articles appearing elsewhere in this issue describe the methods pursued in the conduct of special shop operations that have no counterpart in ordinary maintenance of way work. Similar conditions arise in rail resaw plants and other shops where small groups of men are employed to carry on work of an unusual character. Having been placed in charge of a plant of this kind, the foreman realizes that his success is measured by the economy of its operation. The lower the cost without any falling off in quality the better he is regarded by his superiors. However, in many cases the foreman is so circumscribed by rules and regulations that he is allowed but little latitude in the modification of conditions whereby he may effect a decrease in the cost. The rate of pay of his men is determined by others and he receives notices of cuts in the rates of his men exactly as if he were a foreman of a section gang or one of the other large groups of employees doing work of a thoroughly standardized character. It must be conceded, of course, that no single influence is more certain to produce a reduction in the cost per unit of work than a cut in the rate of pay. Nevertheless, there are circumstances under which an arbitrary change in the wage rates or the blanket application of a general rule will play havoc with the efficiency of the work in one of these small specialized plants. Certain of the operations in these plants require more skill than others. In certain operations there is a key man whose initiative and energy very largely determine the efficiency of the entire organization and a flat wage rate for the entire force or a differentiation of rates along established craft lines is sure to cause difficulty. It is apparent that this inability to introduce a certain flexibility of organization must explain in large measure the advantage which the small contractor is able to maintain in competition with the large corporation.

**Maintaining the Motor Car.**

The introduction of any essentially new idea and its practical application to the field in which it is best adapted is sure to give rise to new conditions which in turn call for the application of further developments until a state of balance has been obtained. Thus, in the case of the railway motor car, it was assumed at the start that its use must be justified by the lengthening of section limits, and certain roads actually discharged a part of their foremen on the assumption that the motor car would enable the others to cover longer territories. Later, it was learned that the motor car could readily be justified by other advantages than that of decreased supervision, and the old section lengths were restored. The motor car is a complex machine as compared with the hand car. It is self evident, therefore, that it requires more careful maintenance and gives rise to the organization of forces charged with the care and repair of the car. This is in no sense a reflection on the motor car and cannot be given as a reason for opposing it any more than one could attempt to discredit the automobile because it requires the operation of many public garages, or that the railroads should go back to the use of kerosene lamps in trains because of the complications attending electric car lighting. However, there is no gainsaying that the problem of motor car maintenance has been one of considerable difficulty for maintenance of way officers, not because there is something fundamentally difficult about it, but simply because it is something new. For the same reason, the manner in which it has been solved differs on various roads. One plan of organization is that followed on the Louisville & Nashville as described elsewhere in this issue. This may not meet the requirements of other roads, but unquestionably many of the detailed methods followed could readily be applied else-

where. To recognize definitely that the motor car is a piece of equipment which requires a certain amount of attention, is in no sense a reflection on it as a necessary utility in railway operations. To meet this situation squarely and recognize the requirements of the motor car is the prime essential for success and economy of its use.

**The Selection of Tools**

One of the problems confronting maintenance of way and purchasing officers is to determine the quality of tools required for maintenance forces and to insure that they secure the quality which they desire and specify. Each tool is designed to meet a different requirement and must be made accordingly. Obviously, a lining bar must be made of a different material and in a different way from a shovel or a chisel. Much of the service life of a tool depends upon the workmanship put on it. The heat treatment, the tempering and the dressing of the tool may determine its success or its failure. For this reason the practice of buying tools on price alone should meet with little favor and most roads prefer to purchase their requirements from a manufacturer on the basis of proven quality and service. A few roads have endeavored to open the field for wider competition by the preparation of specifications for their tools. This idea has not, however, received wide acceptance because of the many factors affecting the quality of the tool which cannot be covered by specifications. This suggests the necessity of continued service tests of both standard and experimental equipment to determine the life which may reasonably be expected of each tool and to afford a basis for comparison with others which may be tried from time to time. There is also a need for the development of accelerated tests which will indicate the relative merits of competitive tools quickly. By studying the service life of tools continually in comparison with their cost, a road can determine the cheapest in ultimate cost and select accordingly. Such an investigation is an incentive to tool manufacturers to strive for quality in their products.

**Tell Your Men the Cost**

The operations of a railway are so varied that it is not surprising that wastes develop which escape detection for a time. The only successful way to eliminate all losses of this character is to enlist the whole-hearted co-operation of every employee. The first step in this direction is to present the facts. Several years ago the Buffalo, Rochester & Pittsburgh adopted the practice of placing the cost of all standard supplies in the order books given its foremen and then requiring them to enter these costs on all requisitions for tools and other materials ordered and to total these costs. In this way the fact was brought home to these men that the materials which they were using cost money and they naturally became more careful in their ordering. The Illinois Central has attacked this same problem in a different way. In a series of articles now being published in the employees' magazine, attention is called to the magnitude of the road's expenditures for many of the common supplies. When an employee learns that this one road spends $200 per day for gasoline and that the saving of only 20 per cent of this consumption (a conservative estimate of the amount wasted in one way or another) will purchase 80 motor cars, he gains a new conception of the value of even the least important supplies he is using. Few men are naturally wasteful if properly informed regarding the value of materials, and maintenance officers have a great opportunity to effect real savings by telling their men of the results of waste.

**The Use of Tie Dating Nails**

A number of years ago when the treatment of ties was in the experimental stage, several roads made extensive use of dating nails in an attempt to secure complete data regarding renewals over the entire system. It was soon found that this gave rise to records so voluminous as to defeat their purpose and the practice was abandoned. With this decision came the quite general abandonment of the use of dating nails. No road has given the question of ties more attention than the Santa Fe. It is therefore of more than usual interest to note that this road returned to the use of dating nails last year and that every tie inserted in the track now carries such an indication of its date of application. The cost of the dating nail is negligible, while its value is reflected in several ways, not the least of which is its psychological effect on a foreman who will hesitate to renew a tie because of exterior appearance if the nail indicates that its normal life has not been secured. It is also a constant indication of the life which the ties are rendering and even though few or no records are kept, it affords the evidence for inspection or comparison whenever desired.

## THE FOREMEN AND THEIR WAGE REDUCTION

MAINTENANCE FOREMEN in common with other railway employees are facing a cut in wages. This cannot but cause unrest and discontent, for no one welcomes a reduction in his income. There is a difference of opinion regarding the advisability of reducing the wages of foremen at this time, but the fact remains that the United States Railroad Labor Board has seen fit to award a reduction in their wages. This being the case the foremen owe it to themselves and to their families to weigh all phases of this question fully before determining their course of action.

The decrease which went into effect on July 1 was ordered by the United States Railroad Labor Board, the same organization which granted increased wages in 1920. This body was created by the Transportation Act and is an agency of the government designed to secure fair play for employee and employer alike and to protect the public against lockouts and strikes. While the present reduction affects the pay of foremen as well as men, it should be noted that the foremen are reduced only about half as much as the men, thereby increasing the spread between the two and tending to make the position of foreman more attractive to the ambitious men in the gangs.

We believe the board has acted wisely here. The foreman is an important link in the maintenance of way organization. Upon him rests the responsibility for the amount and character of the work done by his gang. He has acquired his position by years of service in the ranks. It is through him that the spirit of loyalty in the force is engendered. The increase in this differential is as it should be, for loyal efficient foremen are necessary to the successful conduct of maintenance of way work.

It should also be remembered that these reductions in wages are a step in the process of deflation in all industries. They are made necessary by the insistent demand of the public for cheaper transportation which have been evidenced by orders of the Interstate Commerce Commission for reductions in freight rates aggregating over $400,000,00 annually, the larger part of which also became effective on July 1. Obviously, the roads must reduce their operating costs as their income is cut.

It may also not be amiss to call attention to the fact that statistics compiled by the Labor Board show that

after the decreases become effective on July 1, the average pay of section foremen will be 51.2 cents per hour as compared with 23.3 cents per hour in 1915, an increase of 119.7 per cent. Allowing for changes in the cost of living, and measured in terms of what the new wages will buy, the board figures that the new wage will still be 38.3 per cent greater than that of seven years ago.

The strike vote which has just been taken among maintenance of way employees refers to two principal grievances—the reduction in wages and the letting of maintenance work by contract. The Labor Board has handed down decisions within the past few days affecting two roads in which it declares such contracting an evasion of the law and has ruled that the employees of the contractors are subject to the regulation of the Labor Board the same as men employed directly by the roads. The board has thus removed one of the two points at issue. we believe that it is incumbent upon the railways and their employees alike to adhere to the decisions of the board, for in this way the prosperity of the country and the interests of both parties to the controversy will be promoted. While some of the roads maintain that the Board has exceeded its authority in such decisions, we believe that such contracting as has been done in violation of these decisions should be abandoned and that the roads should conform to the decisions even though they may not be to their liking. By the same reasoning we deplore any tendency among maintenance foremen to fight the decision of the same Board reducing their wages.

## THE BRIDGE SUPERVISOR AND HIS RESPONSIBILITIES

NO PHASE of the bridge supervisor's duties bears more heavily on his shoulders and is transmitted through him to his superiors, the division engineer and even the bridge engineer, with greater emphasis than his responsibility for the security of bridges. Insofar as this depends upon adequacy of design, he cannot be held to account, but in matters relating to deterioration or other defects which may be noted by an inspection of the bridge the responsibility is primarily his. Defective rivets, rotted piles, loose counters—these are among the things which he must watch personally or by proxy through some reliable subordinate.

But these are as minor details when compared with the burden placed on him in times of high water. Then rushing torrents screen from his view all but the upper portions of the structure and he is forced to depend largely on his memory and more or less ineffectual soundings for his estimate of its security for traffic. Nevertheless, it devolves primarily on him to say if the bridge may safely carry trains. If he is needlessly cautious, he will involve the railroad in unnecessary delays or in detours that may prove highly expensive and as soon as the waters have receded the accuracy of his judgment will be disclosed to his superiors. On the other hand, he must not take any chances. But no matter how grave his duties are with respect to the security of the bridges, the flood period requires that he be engaged also in the active direction of the forces at his disposal and the distribution of materials so that they may be available at a moment's notice for the repair of damages that may occur momentarily at any of a dozen points in his district. It is success with which he sub-divided his attention among these various responsibilities which determines his fitness for the important position he holds.

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LARGE OIL CONSUMPTION.—The use of fuel oil by railroads in the United States during 1921 amounted to 38,008,024 bbl. as compared ith 45,847,000 bbls. in 1920.

# Letters to the Editor

## Drainage a Primary Requisite to Good Track

Satanta, Kan.

TO THE EDITOR:

In a recent issue of the *Railway Maintenance Engineer*, there appeared a discussion of the prime requisites of good track in which some selected surface, line and gage. All of these are important, but to have them we must have drainage. Soft places in a roadbed mean low places in track, a corresponding irregularity in line and the consequent spreading of the rails which necessitates regaging which in turn calls for the drawing of the spikes, disturbing the tieplates, plugging spike holes, etc., all of which render the ties more susceptible to decay and premature renewals. The strength of the track depends therefore on the strength of the roadbed and any measures which will protect it from damage should be taken.

The most important essential to insure good track is good drainage. Few persons realize that every 1½ in. of rainfall adds approximately a gallon of water to each square foot of roadbed, or 84,480 gal. to the mile on single track and 158,400 gal. to the mile on double track line.

In passing over new track after a heavy rain every maintenance man has noticed the water seeping out of the ballast on top of a new fill; as traffic is put on this same track this is not so evident because the water is slowly softening the roadbed, causing the uneven settlement of the track which results in low joints. On long hills when the traffic has forced the ballast into the fills the water slowly seeks its level, seeping through the ballast, often from two directions, to the bottom of the hill, the lowest and consequently the weakest point, where it renders the embankment so unstable that a slide results which if it does not cause an accident, at least creates an extra expense and delay to traffic that may prove very serious.

No effort should be spared to give the track every possible chance to drain. A small amount of preventive is worth a lot of cure in tamping and lining track over soft places that have resulted from neglect of drainage. In working on ballasted track I have found soft places from which, when opened, water would flow for several hours. If cross drains had been put in at regular intervals this condition might have been prevented.

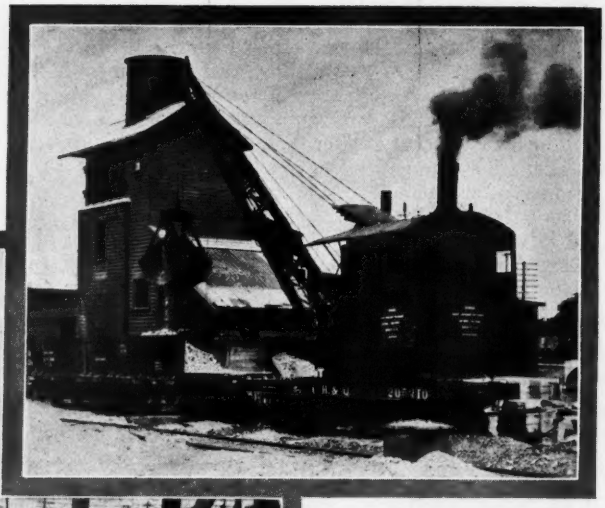
On some roads the equipment is heavier in comparison with the roadbed than it ought to be and consequently a trough is formed in the grade that fills with water that has no chance to get away unless drained; this is especially true in cuts which must be kept ditched and tiled to carry away all surplus water.

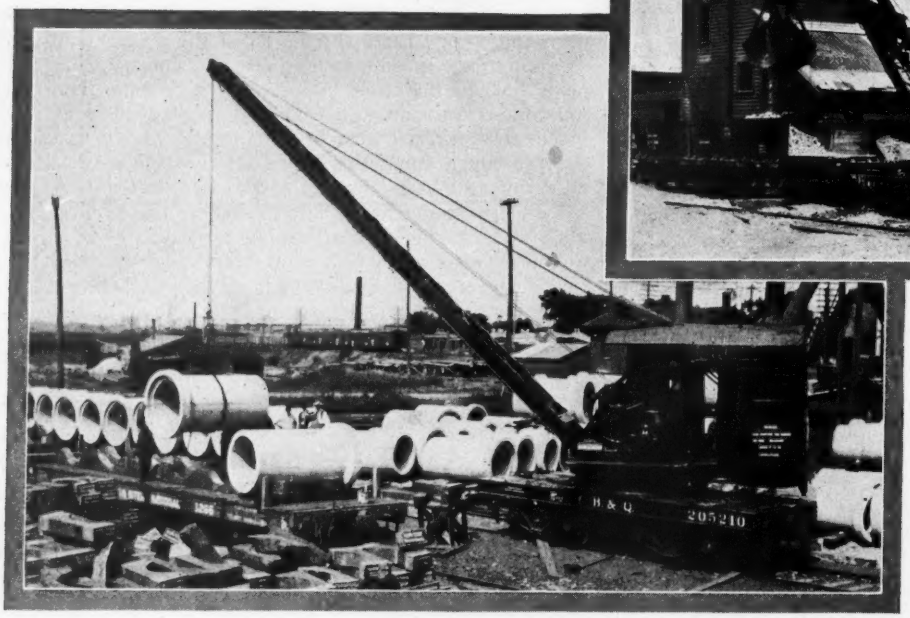
As a protection against the uneven settlement of fills on new tracks that are to be ballasted I suggest that a section of earth nine feet wide and three or four inches high be left in the center of the embankment; this should be simple enough with the improved road machinery that is used in these times.

Another expedient after the track is laid and the necessary leveling up is done, is to cut some of the top off the embankment with a spreader car. This will insure better drainage and leave a uniform surface on the fill, improving the appearance.

W. H. DURBIN,
Track Inspector, Atchison, Topeka & Santa Fe.

# How the Burlington Builds Concrete Culvert Pipe






*A Locomotive Crane Unloads Reinforcing Bars Fills Up the Gravel Bin and Loads the Pipe on Cars.*

C. H. CARTLIDGE, who was bridge engineer of the Chicago, Burlington & Quincy until his death in 1916, was one of the foremost pioneers in the application of reinforced concrete to railway purposes and among other developments which he sponsored was the design and construction of concrete pipe. The preliminary work along this line was carried on in 1906 at a makeshift plant erected at Montgomery, Ill., a station on the Burlington, a short distance from Aurora, where space was available convenient to the tracks. During that first year, 2,256 lin. ft. of pipe were built with results so favorable that increased facilities were provided and during the following year the production was increased to 14,032 lin. ft. Further experience confirmed the original conclusions and the production was increased, reaching a maximum of 42,522 lin. ft. in 1911. With added experience, the facilities have been amplified at Montgomery and a second plant has been constructed at Hannibal, Mo., the combined production of the two plants up to and including 1920 aggregating 422,813 lin. ft. of concrete pipe which has been used under embankments on nearly all parts of the Burlington system.

The original facilities provided at Montgomery were primitive, the manufacturing operations being conducted in the open air, which precluded any winter work. Later a shed was added in which the pipes could be cured with the aid of steam heat, and thus allow the work to continue during the winter months. Further developments have included additional equipment for the purpose of reducing the manual labor required for the concreting and the handling of the raw material and the completed products, but in a large measure the improvements have consisted in a careful refinement of the minor details of the manufacturing process from the preparation of the reinforcement "cages" to the loading of the pipes on cars for shipment with a view to reducing the labor cost, improving the quality of the pipe and reducing the possibility of breakage. These various methods taken collectively comprise a technique in the making of the pipe, an account of which will be of value to all concerned with the manufacture of concrete pipe or other concrete

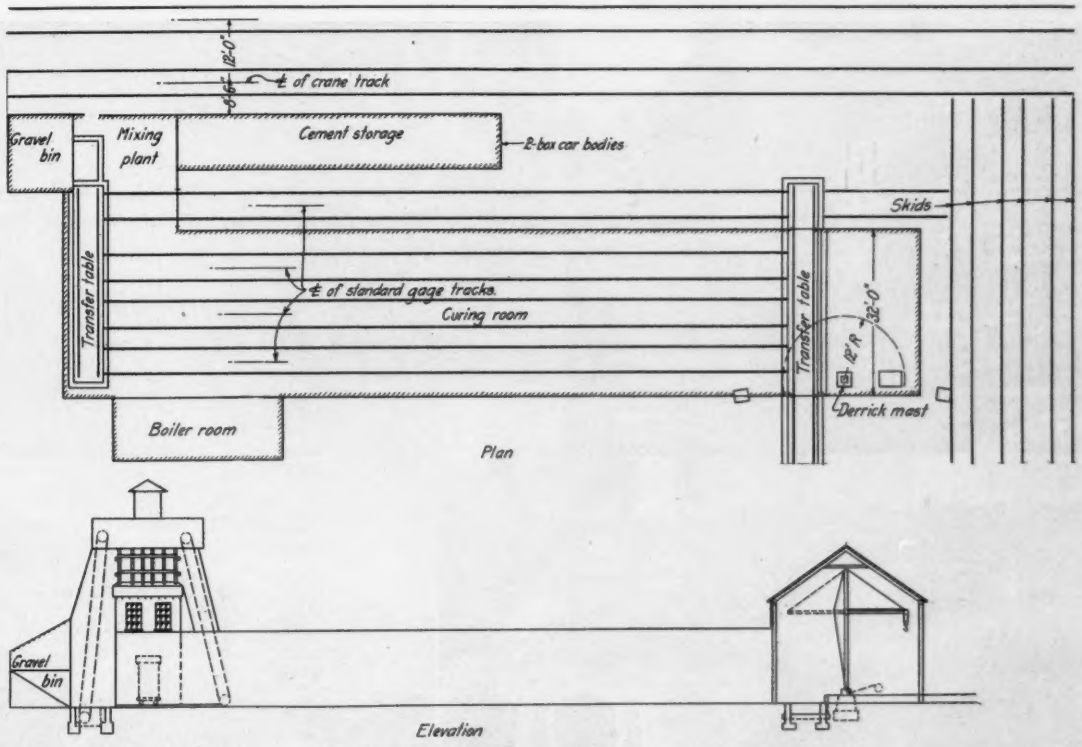
*"Andy" Anderson has been foreman of the concrete pipe plant at Montgomery ever since the first experimental pipe was made there with a makeshift outfit* 15 *years ago. Many of the improvements in plant and methods designed to save time and labor have been developed from ideas that came to him in the course of his long experience. Since the first pipe was made in* 1906 *the Burlington has built and placed under track more than* 70,000 *concrete culvert pipe, which, if placed end to end, would make a string* 80 *miles long. By far the larger part of these have been made at Montgomery under his direct supervision.*

The pipes used on the Burlington are of the oval cross section, consisting of two semi-circles connected by tangents of 4 in. or more in length. They are reinforced with a single ring of metal in a circular shape following the Parmalee patent which expired in 1921, that is, the reinforcement is adjacent to the inside surface at the top and bottom of the pipes and adjacent to the outside surface at the two sides. The pipes are provided with a bell and spigot joint. Various sizes are made, ranging from 12 in. to 72 in., but at present only three sizes are made at Montgomery, namely, 24-in., 36-in., and 48-in.

### Several Operations Involved

Manufacture of concrete pipes is divided naturally into several primary operations: (1) the unloading and storage of material, (2) the preparation of the reinforcement, (3) the mixing and placing of the concrete in the forms, (4) the curing of the completed pipe, (5) the removal of the forms and the placing of the pipe in the storage yard and the resetting of the forms for the next pouring, (6) the loading of the pipes for shipment. Operations, (3), (4) and (5) imply a definite sequence and must be co-ordinated for a continuity of the work. The others bear no definite relation to each other and can be conducted more or less independently except to insure a sufficient quantity of material and an adequate number of cages in readiness so as to avoid interference with the three operations of building the pipe. However, as the force employed at Montgomery is small, from 9 to 14 men, it is not important that the operations be continuous so long as all the men are kept busy at useful work. This has been insured by following the policy of training the men in each of the various operations so that a thoroughly flexible organization is maintained. The men are shifted from one job to another as occasion demands.

The general plan of the plant is extremely simple. The forms are filled at one end and emptied at the other. At one end is the mixer and at the other is a platform and derrick for taking off the forms, removing the pipes and resetting the forms for the next filling. In passing from the mixing plant to the dismantling room, the pipes traverse the length of the curing room in the course of two or three days, while the assembled forms travel back to the mixer outside of the building. The effectiveness of this plan is founded on the proposition that each form must be readily movable at any time during the complete cycle of operation, consequently a rubble or push car has been provided for each form and the car stays with the form throughout the entire operation. Three tracks are provided in the curing house, with a return track outside while transfer tables at each end complete the layout.




**General Outline Plan and Elevation of the Plant**

*As the forms are filled with concrete at the mixer the cars on which they stand are pushed on to the transfer table at the left. This is used to spot them opposite one of the tracks in the curing room. After two days they are moved to the transfer table in the form room where the pipes are taken out of the forms which are reset for filling.*

### Forms of Steel and Wood

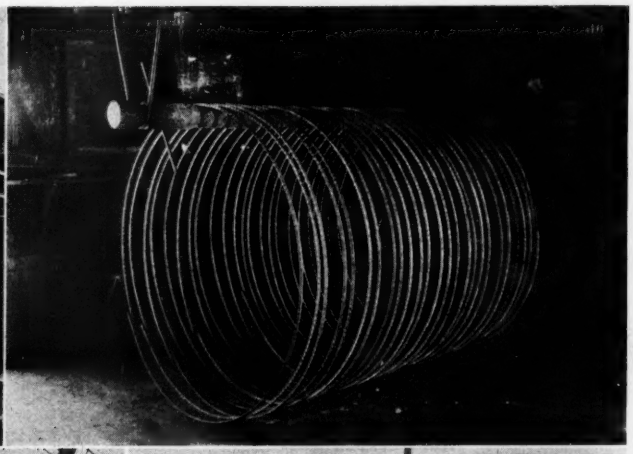
At present the plant at Montgomery is provided with fifteen 24-in. forms, twelve 36-in. forms and nine 48-in. forms, or a total of 36 in. all complete with cars. With a minimum of two days of curing of the pipes before the removal of the form, this allows a maximum daily output of eighteen pipes, but ordinarily the plant is not run to this capacity, the average production being about one pipe per man per day. The excess in the equipment, however, is necessary to allow a degree of flexibility in the output of the several sizes to accommodate the variation in the demand for them, that is, there may be times when a considerably larger proportion of one particular size may be required that is represented

by the proportion of forms available. The forms were originally of wood construction but have been largely replaced by steel forms as the wooden forms wore out. At present all of the 36-in. and 48-in. forms and three of the 24-in. forms are of steel construction. Twelve of the 24-in. wooden forms are still in use by reason of the fact that the 24-in. pipes being lighter do not place such a severe strain on the forms in the process of handling as is the case with the larger sizes and have therefore, lasted a greater length of time.

The preparation of the reinforcement or "cages" is necessarily a hand operation, therefore, advantage has been taken as far as possible in the use of prepared fabrics for the 24-in. and 36-in. pipes with auxiliary wire reinforcement for longitudinal stiffness and to reinforce the bell end of the pipe. For sizes larger than 36 in. in diameter no prepared fabric has been found that provides adequate reinforcement, consequently, it has been necessary to build up the cage from 3/8-in. sq. corrugated bars.

**The Pipe Must Be Loaded Carefully**

*Wooden Saddles Are Provided Which Insure Safe Loading and Are Returned to the Plant When Released.*



**Much Handwork on the Reinforcement**

*The Hoops Are Assembled on a Pole, the Mesh Reinforcement Is Curved on a Tinner's Rolls.*

## How The "Cages" Are Made

The wire mesh is unrolled on a long runway by mounting the roll on a mandrel consisting of a length of 3-in. pipe supported in a horizontal position by two posts. The wire mesh is thus laid out in a flat position, is cut off to the desired lengths with high power hand shears, and is then taken to a set of tinners rolls for curving to a cylinder of the proper diameter. The cages are assembled in the reinforcing shop, the work consisting in wiring the splices and attaching 10 longitudinal reinforcing bars which have been bent to give the flare of the bell. The ends of these flared rods then receive the hoop bars of the bell.

All work on the rod cages for the 48-in. pipe is also done in the reinforcing shop. The rods are received in cut lengths from the mill and the circumferential rods are curved on a wagon tire roll which will handle three bars at once. To assemble the rod cage successfully, depends on having the hoops of the correct diameter. This is insured by wiring the splice on each hoop over a templet consisting of a wagon tire securely fastened to a heavy table. After bending to circular form, the rods are placed over this hoop and wired. An offset in one side of the wagon tire facilitates the wiring.

The assembling is done on a pole 7 ft. long by 4 in. in diameter suspended from the ceiling at such a height that the hoops will hang clear to the floor. This pole has grooves turned in it to receive each hoop bar at the correct spacing as is shown in one of the photographs, and while the hoops are suspended from this rod, the longitudinal bars are wired to them. All wiring is done with No. 16 black annealed fence wire. Experience has shown that wire nippers are better adapted to this work than ordinary pliers. After a little experience, the men acquire skill in using these nippers and the work is done quickly.

Concrete for these pipes is composed of a 1 to 4 mixture of cement and gravel which is received from a pit at Sheridan, Ill. The gravel is unloaded from the

cars by a locomotive crane which delivers the material either to a 35-cu. yd. hopper or into a storage pile. A screen over the hoppers of ¼-in. bars, spaced 1½ in. center to center in both directions excludes the larger size stones which are deposited in a pile and loaded out by the crane. The cement is stored in two large box car bodies placed end to end adjacent to the material track.

### Little Labor Required

Both the cement and gravel are elevated by bucket chain hoists to secondary bins located above the mixer. The gravel bin has a capacity of 15 cu. yd. and the cement bin a capacity of 70 sacks. As shown in one of the photographs, a water tank is also provided at the top of the mixer plant so that the gravel, cement and water can be delivered to the mixer by gravity after passing through suitable measuring devices to insure proper proportions.

The concrete is transported to the forms by a short chute which delivers it on a receiving plate set on the inside forms. This plate is of such size that the concrete deposited on it is easily scraped or shoveled into the annular space between the inside and outside forms. No spading is done, but the concrete is worked down readily by jaring or shaking the reinforcement thoroughly with the aid of a crow bar. The operation of concreting requires the full time of only two men, the machine operator who controls the proportion, the amount of water and the discharge of the concrete, and the form man who is responsible for the depositing of the concrete into the forms and around the reinforcement A third man, the finisher, who works in the curing room comes to help whenever one of the form cars is to be shifted either to the mixer or away from it, his time being otherwise occupied in finishing the exposed concrete at the top of the form and marking the date and also the word "top" in the proper position on the end of the pipe.

From the mixer, the form is moved onto the transfer table and then shifted to one of the three tracks in the curing room. In this room one track is assigned to each size of pipe and the cars are moved ahead on the track as space is made for them by the removal of cars from the far end of the track to the transfer table in the form room. The regular routine of the operation is such that the pipe would normally stay in the curing room for two days, but the date marked in the concrete at the end of the pipe insures the full duration of this time before the pipe is removed.

### More Men Required in Form Room

The handling of the completed pipe to remove the form and place the pipe in storage together with reassembling of the form with a new reinforcement cage is the critical detail of the cycle of operations since it occupies more time and takes more men. Four men are normally engaged in this work. In addition to the transfer table mentioned above, the form room is fitted with a platform elevated to the level of the tops of the push cars and a stiff leg derrick equipped with a jib boom operated by a small steam hoisting engine.

The 24-in. pipe with wooden forms are cast bell end up and are removed from the forms by laying them on their sides while still enclosed in the outside form. Then after one-half of the outside form is taken off, the inside or core form is removed and a wooden beam is passed through the pipe so that it can be lifted in a horizontal position onto the push car. It is then rolled out of the building and transferred to one of the storage skids with the aid of a stiff leg derrick located conveniently in the center of the storage yard. After the car has been released from the completed pipe it is rolled back into the form room and the form reassembled on it, after which it is again rolled out of the building and passed back to the mixing plant on the outside track.

In the Form Room—Resetting a 24-in. Form with Reinforcement

The steel forms for the outside of the pipe were made in four sections with flanged bolted joints and a shaped bell bottom. The bell ring, that is the part required to make the inside of the bell, is in two halves connected by wedges. A somewhat similar construction is used for the inside or core form. The pipes in the steel forms are cast with the bell end down, therefore, when these forms are to be dismantled it is convenient to remove the outside form before taking the pipe off the car. For this operation, a rope sling is placed around the pipe and it is hoisted up and laid on its side so that the bell ring and the core form may be released and removed

while the pipe is in a horizontal position. For the removal of the core form, it has been found convenient to pass a line from the hoisting engine over a snatch block secured to the side wall of the building. Before replacing the forms on the cars they are thoroughly cleaned and all surfaces exposed to the concrete are given a coat of crude oil. One precaution which must be taken in the handling of the steel forms is to insure that the true shape is maintained in the cross section because steel forms are more or less flexible. This is taken care of at the bell end by providing a master ring secured to the platform of the push car over which the bell ring must be fitted, and also in providing a templet for the top or spigot end of the pipe to serve as a pattern for adjusting the shape of the inside form by means of turn buckles.

### Improved Loading Methods

Fifteen years' experience in the handling of concrete pipes has naturally taught some lessons in methods of loading them on cars, not only to insure safety against breakage and security on the car, but also in the interest of economy of loading and unloading. The method has resolved itself into the providing of saddles made of 8 in. by 16 in. timbers cut in sizes to fit each of the three sizes of pipe. These saddles are made of such a length that the pipes will be spaced the correct distance apart when the saddles are placed end to end over the length of the car. They are blocked solid at each end by a timber braced against stakes driven in end stake pockets. By following this procedure and wedging in the saddles solidly, it is not necessary to spike them to the car floor. By avoiding the spiking and by covering the ends of the saddles with galvanized iron as shown in one of the photographs it is possible to use these saddles a great many times. The galvanized sheathing affords opportunity for stenciling a return instruction as shown in the photograph.

The development of the plant at Montgomery, including its recent reconstruction to provide more adequate facilities, has been under the direction of G. A. Haggander, bridge engineer of the Chicago, Burlington & Quincy. The plant is operated under the supervision of the stores department of the Burlington, J. G. Stuart being general storekeeper. A. H. Anderson has been foreman in direct charge of the plant ever since it was opened in 1906.

## The Track Shovel

DURING the last four years the Illinois Central and the Yazoo & Mississippi Valley used 129,110 shovels of all kinds for which they paid $143,001.50. Of these 88,266 or 68 per cent were track shovels, representing an expense of $81,102.35, or an annual expenditure of $20,275.59. An average of 74 track shovels were furnished each working day at a daily expense of $70. Assuming that the track forces used no other tools than shovels for 50 per cent of the time the average life of each shovel was only a little over two months.

Track shovels will, of course, wear out in time but certainly not in two months. The majority are discarded on account of damage caused by abuse rather than wear; no doubt many are also diverted to other than railway use. The proper care and use of track shovels should reduce the purchase of new shovels at least 50 per cent.

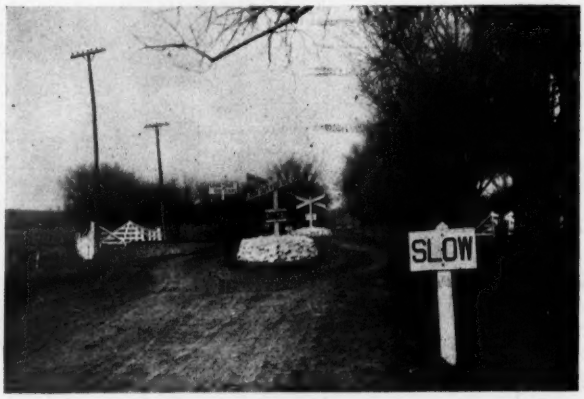
Many shovels are broken by using them to nip up ties or to pull ties out of the track. Shovels are also damaged by using them to drive stakes and for other purposes requiring a hammer or maul. Shovels should not be thrown violently from a hand car or a motor car or in handling; neither should they be thrown promiscuously in a pile with lining bars, jacks and other heavy tools or materials which are liable to damage them.

Where shovels are used for handling mud they should be cleaned after use, and the blades oiled if they are not to be used again for some time. Shovels used on track should not be left where they may be damaged by passing trains or by ties, rails and other heavy material.

An examination of hundreds of shovels shows plainly that they have been damaged by abuse. On the other hand, many instances can be cited where track and other shovels have been in almost constant use for 12 months or more and are still in good condition, demonstrating that it should not be at all difficult to effect a material saving with very little effort.—From the Illinois Central Magazine for July.

## A New Type of Highway Crossing Protection

AN INTERESTING type of highway crossing protection, designed to retard the speed of automobiles when approaching railway tracks, has been installed recently on the Eastern division of the Chicago & North Western about two miles west of Meadow Grove, Neb. This consists of the construction of a mound of stone in a conspicuous position in the center of the highway 100 ft. on each side of the track or 50 ft. beyond the limits of the right-of-way. Being located in the center of the




**There Is No Excuse for Failing to See These Warning Signs**

highways these mounds are in the most conspicuous positions possible, where it is impossible for drivers to fail to see them. Automobile drivers are, therefore, first made aware of the fact that they are approaching a railroad crossing and must put forth physical effort to retard fast moving cars and steer them around the mound. If they then find a train approaching they still have nearly 100 ft. in which to stop, which distance is sufficient for speeds up to 30 to 35 miles per hour. This particular type of "retard" was adopted after considerable discussion with the county commissioners because it seemed to meet with less opposition than other types, especially "humps" which were objected to on account of the danger of damaging automobiles, whose drivers might not know of their presence and who might overlook or disregard the advance warning signs.

We are indebted for the above information to C. F. Womeldorf, division engineer, Chicago & North Western, Norfolk, Neb., under whose direction the crossing was built.

# Do You Get Uneasy When the Clock Points to Quitting Time?

## President Alfred of the Pere Marquette Says That Is a Good Index of Your Interest in Your Work

BY WALTER S. LACHER

HAVE YOU EVER felt that the cards were stacked against you, that no matter how hard you tried everything went wrong, that you had an indifferent job with a poor road and that it wasn't being run the way it ought to be? Some men in this predicament have quit with the hope of finding more congenial employment elsewhere. Others, like Frank H. Alfred, who is now president of the Pere Marquette, have remained with the job, fortified with the firm belief that opportunity would come in the end. In his opinion there is opportunity for success with almost any railroad.

**Frank H. Alfred**
*President, Pere Marquette.*

"A man shouldn't feel disheartened," he said, "because the volume of business, the financial strength or the physical condition of the road which employs him is not as favorable as that of a neighboring property. Success in railroading consists in making a profit on the traffic to be had, and it is possible for a light traffic line to secure as favorable an operating ratio as a heavy trunk line. Physical superiority of one road may be offset by better personnel on another, because 90 per cent of the success of a railroad depends on the personal element. The road that is being directed with superior intelligence and energy will win in the end and will become the more profitable property if the effort is continued long enough."

Mr. Alfred had been in railroad service for a long time before he was given an opportunity to demonstrate these ideas to his own satisfaction. A student at the universities of Ohio and Michigan for two years under circumstances that did not permit him to stay long enough to graduate, he gained enough training in engineering to make himself useful in railway construction work, first, on the Columbus, Lima & Milwaukee in 1887, and later on the Scioto Valley railway, during which time he continued his studies in his chosen profession. However, his real chance for development as a railway engineer came in the spring of 1889 when he learned that the Norfolk & Western, which acquired the Scioto Valley as an entrance into Columbus, Ohio, was going to build extensive terminals in that city, so he applied for a position of assistant engineer on this work and for the next five years was in charge of the construction. For the next seven years he had a varied experience on a number of roads. For two years he served as assistant to the chief engineer of the Columbus, Hocking Valley & Toledo. Then followed a few months with the Denver & Rio Grande at Salida, Colo., three years as engineer maintenance of way with the Cleveland, Akron & Columbus (now a part of the Pennsylvania), and a short period in a corresponding position on the Wheeling & Lake Erie.

His connection with the Pere Marquette was due to one of those freaks of fortune that come once or twice in the life of every man. While engaged temporarily on an appraisal of the railroad properties of the state of Michigan under the direction of Dean M. E. Cooley of the University of Michigan early in 1901, he was required to spend considerable time at Detroit on a valuation of the Pere Marquette. The resulting contact with the officers of that road led to an offer to him of a position as assistant engineer, which he accepted in March of that year. But fortune favored him still further, in that less than a year elapsed when, on the resignation of G. H. Kimball as chief engineer, it fell upon him to serve as acting chief engineer. The title of chief engineer was conferred on him a few months later.

"I continued in this position," said Mr. Alfred, "until 1905, when the Canadian White Company, Ltd., was organized to handle some extensive railway construction contracts in the Canadian Northwest and I was offered the position of manager at a considerable increase in salary. I was engaged in this work until 1908, when I returned to the United States as assistant to the president of the Cincinnati, Hamilton & Dayton at Cincinnati. In this position I handled maintenance and operating matters, but was employed principally on an extensive improvement of this property, including the construction of coal docks at Toledo and considerable grade revision work. In 1910 I was made general superintendent, my first real operating position, and I retained this for some

time following the acquisition of the Cincinnati, Hamilton & Dayton by the Baltimore & Ohio in 1911, returning to the Pere Marquette in 1912 as assistant general manager. Later in the year when William Cotter, the general manager, resigned, I was given his position."

Mr. Alfred was not inclined to go into any detail concerning the earlier years of his service with the Pere Marquette, but the history of that railroad and its financial difficulties have been given wide publicity and anyone who has taken the trouble to familiarize himself with it can readily realize the trials it must have brought to those of its officers who had the interest of the property at heart. Between December, 1905 and April, 1917, when the road passed through two receiverships, there were frequent changes of management with corresponding modifications in policy and with it all a depreciation of physical condition that earned the road an unenviable reputation with the public. In the years immediately following Mr. Alfred's return to the property in 1912, matters were not improved. There were times when he must have been definitely out of sympathy with the manner in which the fortunes of the road were being directed, but, being possessed of a fighting nature that persists in spite of all obstacles to the application of his own ideas and methods, he held on until finally late in 1914, the receivers placed him in full charge of the operation of the road. It may well be said in passing that his relation to the property has not changed appreciably since that time whether he served as officer for the receivers, president of the corporation or federal manager for the Director General of Railroads during government control.

"When I was elected president of the road in 1917," Mr. Alfred explained, "I concluded to retain the position of general manager because I believe that on a road the size of the Pere Marquette, the chief executive should maintain the close contact with details that the general managership gives him. As I mentioned before, I believe that the most important element in the success of a railroad is the human element, but this is not effective unless it is applied without let up year in and year out, and the head of the property cannot expect his men to keep everlastingly at it if he himself relaxes. I know from experience that any tendency to take it easy is bound to show up in the operating results."

As a human machine a railroad must have its various parts thoroughly coordinated. For this reason particular attention is directed on the Pere Marquette toward the development of a spirit of loyalty and co-operation among the officers and employees. One measure to this end is an annual track inspection by the officers of the road over the entire property and the president makes it a point to participate in this since this gives him an opportunity for a close contact with both the employees and the patrons of the road.

"As a rule, I think an executive will get better results by developing the men he has around him than by looking for better men outside," he explained. "I don't believe in promiscuous hiring and firing. Of course, I am compelled to shift men around to a certain extent in an effort to find places that are best suited to them, but I don't often find it necessary to let a man go. This problem of selecting men for positions is, of course, a very important part of the officer's responsibility and I am constantly studying men from the standpoint of their fitness for promotion."

"What do you consider the most important qualification?" I asked him.

"Dynamic energy is the greatest essential. A man may have everything else, but if that is lacking, he cannot advance far. Then, too, he must have a sincere interest in his work so that he isn't constantly watching the clock. You know what I mean. I have frequent conferences here in this room. Sometime it gets late, and once in a while if we run by the noon hour or it gets along towards six o'clock, some fellow will begin to pull out his watch or turn around and look at the clock. Now if a man has an engagement, or some other urgent need of getting away and will come right out and say so, no one can object to his leaving, but if his anxiety about the hour is just for the sake of getting a meal on time, it means that he is too interested in his physical comfort to take much interest in his work. I enjoy my lunch as well as anyone, particularly if I can go where I will meet my friends, but I find that it isn't often that I can get away in time to have their company."

Mr. Alfred has always exerted himself to the utmost to improve the physical condition of the road along lines suited to its needs.

"I have always taken a keen interest," he explained, "in the welfare of the properties with which I have been connected and so it has been with the Pere Marquette, and I feel that we are going to make a real success of it. I think that our maintenance forces will agree with me that I am allowing them appropriations for the upkeep of their tracks that are ample for the requirements. Men must get away from the idea that the same methods and the same standards of maintenance are applicable to all roads. Don't copy the methods of your rich neighbor by trying to put your line in the same physical condition as his, but seek to reach the standards of condition which will insure safe operation for the character of business to be handled. It doesn't pay to put manganese frogs on a branch line.

"It is the same with construction. When a plan for some improvement is submitted to me, I study it in the light of the actual needs of the road, now and in the immediate future, and not with any thought of what might perhaps be the most excellent type of construction to last for all times."

Mr. Alfred expects much from his assistants but he sets an example for industry by his untiring energy. In order to keep thoroughly informed on all matters he insists on handling an unusual amount of detail himself. But he accomplishes this without allowing details to get the better of him. A faculty for instant decision is not the least among the factors which stand him in good stead in this connection.

What attention to details has done for him was demonstrated most emphatically at a certain hearing before the Michigan Railroad Commission. Mr. Alfred was required to testify at considerable length and evinced a remarkable command of detailed facts and figures concerning all phases and operation of the property.

"But doesn't your close attention to detail interfere to some extent with exercise of initiative on the part of your subordinates?" he was asked.

"No, I expect a man to follow his own devices in carrying out the work assigned to him. I know how he feels from my own experience. When a job was given to me I wanted to stay right with it until it was finished. There was nothing I disliked more than to go back to my superior to ask for additional instructions or advice.

"However, a man should be careful not to exceed his authority. He should not pretend to have more authority than he possesses, because sooner or later he will be discredited when those with whom he has been dealing discover that he cannot make good on his promises. No man in the service, no matter what his position is, should feel hurt because of the limitations placed on him. The president of the road himself cannot always give a decision on his own responsibility. He is often compelled to obtain the sanction of the Board of Directors.

# How the Louisville & Nashville Maintains Its Motor Cars

## A Special Organization Supervises the Operation of This Equipment and Handles All the Repairs

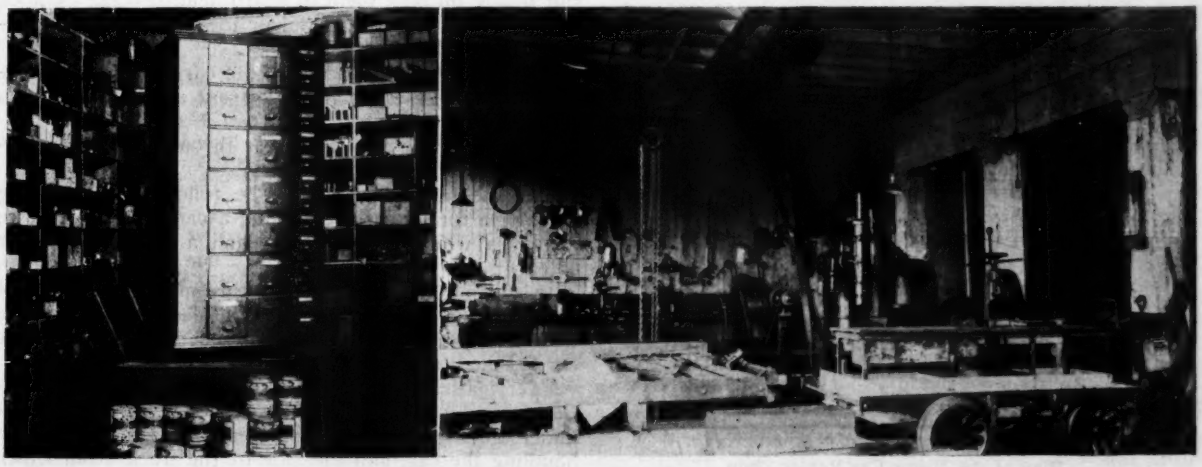
SECTION FOREMEN, bridge and building men, signal and telegraph maintainers, supervisors and others, operate a total of 650 motor cars over all parts of the Louisville & Nashville system. To insure that this large number of cars is operated properly and maintained in good condition requires the exercise of intelligent and well-directed supervision. This has been provided through the organization of a corps of motor car maintainers under the direction of a motor car supervisor in conjunction with a motor car repair shop. The manner in which this organization and plant are conducted to secure the maximum benefit from the use of the cars should prove of interest to the officers of other roads having a large amount of this equipment in use.

Each of the eight motor car maintainers is assigned to a territory and works under the supervision of the general supervisor with headquarters at Louisville, Ky., who co-operates with the officers of the divisions embraced in the various maintainers' territories in directing the work of inspecting and caring for the cars. It is the duty of the maintainer to travel over his territory to inspect the cars, to make minor adjustments and repairs and to instruct the users of the cars in their proper operation and care. These maintainers travel over the line on regular trains except as they find opportunities to make short trips on the motor cars of railway employees. Each time a maintainer inspects a car he makes a report on the form reproduced herewith. This report is of considerable assistance in supervising the work of the maintainer and in checking complaints, the application of new parts, etc. The report also provides opportunity for the maintainer to make recommendations for the general overhauling of the car or the motor or to comment otherwise on the condition of the equipment or the manner in which it is being operated.

The supervisor's time is occupied principally in making trips over the line with the various maintainers to check up and improve their manner of handling of their work. The maintainers have been recruited from the railway shops, from auto garages and from automobile manufacturing plants. Some of the men have also taken courses of instruction at the plants of railway motor car manufacturers.

The railroad has in service some four or five makes of motor cars and several types, sizes and styles of each make. Obviously, the supervision, repair and maintenance of the cars would be greatly simplified if but a single make were used, but fundamental objections to this plan outweigh other considerations. As a means of overcoming some of the difficulties attending the use of several different makes, an effort has been made to segregate the cars of the different manufacturers under certain maintainers, as this enables the latter to obtain a more intimate knowledge of particular makes and also reduces the requirements of their stocks of parts.

A further means of supervising the operation of the motor car is afforded by a motor car fuel report for which a blank form is provided on one page of the foreman's monthly time book. This shows the number of gallons of gasoline and pints of lubricating oil supplied to the car from time to time and also the number of miles run daily. These data together with a record of the fuel and oil on hand at the beginning and end of the month make it possible to compute the number of miles run per gallon of gasoline and per pint of oil, etc., and this information, worked up in a monthly report, affords an opportunity for comparison between motor car operators, makes of car, etc.



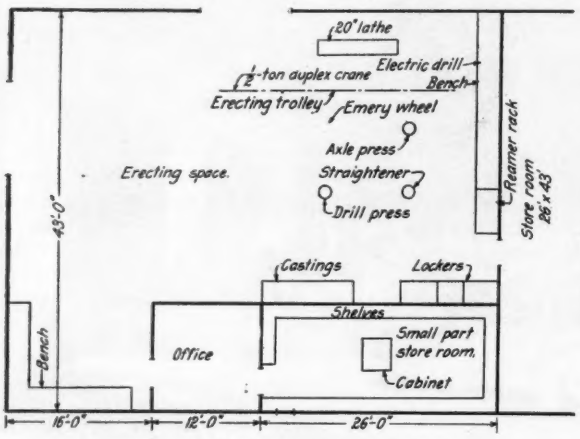
**The Small Part Store Room—The Shop**

By far the major feature of the motor car department's work is concerned with the repair of the cars by the maintainer out on the line or in a small shop at his headquarters and by the motor car repair organization in its shop at Louisville. The subdivision of the repair work between the main shop and the maintainer has been adjusted gradually in the light of the two years' experience with this organization. Cars wrecked because of accident or those requiring complete overhauling are sent into the shop. On the other hand, if only the motor

needs attention, it has been found advantageous to send out a new motor or a motor and rear axle unit to the maintainer for him to install on the car, the old parts being returned to the shop. In general, parts are sent to the maintainer in a form requiring the least work or adjustment. For instance, connecting rods are supplied with the bushings in place; timers and carburetors are always sent out in complete form.

The repair shop is located at one end of an old building abandoned when the Louisville & Nashville general repair shop at Louisville was moved to South Louisville. It comprises a shop room, an office, a stock room and a miscellaneous storage space for lumber, axles and other large second-hand parts. The force comprises a foreman, two motor car mechanics, two helpers, one carpenter and a clerk. One of the mechanics specializes in the electrical apparatus. The shop tools include one 20-in. lathe, one drill press, one straightener, one axle press and one emery wheel, all belt-driven from a five-hp. motor. There is also a portable electric drill fitted with a stand so that it may be used on the bench.

This organization is engaged in the repair of the cars sent in for overhauling and in reclaiming worn parts replaced by new ones sent out to the maintainers. It also looks after the pneumatic tie tampers in use on the railroad. All motors repaired are subjected to a thorough test before being sent out. This comprises, (1) a mechanical test by running the motor from a belt




**Plan of the Motor Car Repair Shop**

off the line shaft for a sufficient time to insure that all bearings and connections are in good shape, (2) an operating test of the motor outside the shop where it is put on a test stand and run under its own power (no gasoline is used in the motors inside the shop), and (3) a 60-mile road test by some member of the shop force after the car has been assembled complete.

The central shop is supplied with an adequate stock of parts for all of the cars used, including one or two complete motors for each make and class of car. Each maintainer also has a small supply of minor parts, such as bushings, spark plugs, wire, bolts, screws, etc., to facilitate his daily work. This material is prorated among the cars in his territory as it is supplied to him. Whenever he needs new parts not carried in his stock, the maintainer makes a requisition for them, giving the make and the railway company's number for the car to which the parts are to be applied. Space is also provided on his daily inspection report for noting parts supplied to cars. If the part supplied is new, it is charged as such against the car on which it is used. If it is second-hand, the only charge made is for the amount of labor and material used in reclaiming the old part returned to the shop so that this may be carried in stock.

The motor car maintenance organization is conducted under the direction of W. H. Courtenay, chief engineer, and J. R. Watt, general roadmaster. H. W. Barnes is the supervisor of motor cars and George Richter is the foreman of the motor car repair shop.

The following is an abstract from rules prevailing on the Louisville & Nashville for the operation of motor cars and for their care by the persons entrusted with them.

## Rules for Operation of Motor Cars

Special attention is called to the great care that should be taken in placing tools on cars and watching them to see that they do not work off the front end of the car or catch some part of the mechanism.

*The speed must not exceed 20 miles per hour* at any time. Run slowly through frogs, switches and around curves. Approach street or road crossings, station platforms or persons or animals near the track *under full control.* Be prepared to stop if necessary.

Do not follow a moving train closer than 1,000 ft. or approach a train standing closer than 500 ft. Do not run motor cars closer to each other than 500 ft. Always run cars in the direction of traffic on double track.

Approach interlocking plants under full control and run slowly through them to guard against being derailed on account of an open derail or towerman throwing derails or switches.

Under no circumstances operate cars after dark without displaying a *white light* in *front* and a *red light* in *rear.*

Do not operate any motor car through a tunnel without a light on the front of the car. Where it is practicable the same rules should be followed in operating through a tunnel as in operating a car at night, that is, display a white light in front and a red light in rear of car.

In starting cars push them off from the rear and not from the side. A car shall not be placed or left on the track unless there is sufficient number of men with the car to take it off quickly in an emergency.

Every possible safeguard should be used in the operation of motor cars, and there should be a thorough understanding as to what part each person will take in handling the car, and the side of the track from which it will be removed should an emergency require prompt action.

Do not run cars alongside of moving trains.

Do not stand on cars while in motion.

When necessary to ship a car on a train the gasoline must be thoroughly drained from the tanks. Gasoline on cars must be carried only in receptacles that are part of the equipment. No excess supply shall be carried. Gasoline must not be handled except in daylight. Open lights of any description or smoking must not be permitted on or around motor cars while tanks are being filled with gasoline. Never strain gasoline through a chamois skin.

Do not tamper with the carburetor. If there is engine trouble it is certain to be due to some other cause than in the carburetor.

Keep grease cups full and give them a little turn every 10 miles. Provide yourself with the proper lubricating oil for your car and do not substitute any other oil.

The use of motor cars must be strictly *confined to railroad business.* Do not allow anyone on motor cars except in discharge of duty.

Push cars, hand cars or velocipede cars must not be

pushed ahead of motor cars. If it is necessary to handle such cars they must always be pulled.

All passenger trains must be cleared by at least ten minutes.

The operation of motor cars through tunnels will be governed by special instructions issued by the superintendent on the division on which they are located.

Motor cars must not be used after work hours or beyond the limits of the section to which they are assigned, except on special authority. Warn those on the car when using brakes suddenly.

## Instructions for Care of Motor Cars

If any motor car needs attention, or repairs, do not ship it to division headquarters without instructions. Put it in the tool house and notify the proper division officer, who will arrange for the necessary inspection or repairs.

Before starting on a trip, the car should be inspected to see that it is in gage and line, brakes in good condition, bolts tight, especially axle bolts, and that the necessary tools, light, fuses, torpedoes, etc., are in place. Practice turning your cap up on end once a week, so as to make a thorough inspection.

### Batteries

Most motor car trouble is caused by some defect in the ignition system, and this trouble is generally due to:

1. Loose connections.
2. Broken connections.
3. Binding posts of the cell coming in contact with other cells and breaking the paper cover, thus coming in contact with metal covering and causing a short circuit.
4. Bottom of paper case of cell being cut through by the metal covering of the cell and the metal coming in contact with bottom of the battery box and causing a short circuit through the metal, dirt or grease in the bottom of the box.

It is important, therefore, to place the cells so that the binding posts will not be in contact with other cells, or the side of the box, and to wedge the cells tightly in the box by using clean dry paper, or waste, so that there will be no vibration of the batteries. It is most important to keep the cells and packing dry.

Flexible battery connections should be used to prevent breakage and they should be arranged to get a proper separation from each other, and from binding posts of other cells. The bottom of the battery box should be kept clean and dry.

Test the dry cells regularly. New cells should test not less than 18 amp. If any cell tests less than 8 amp., it should be replaced. Use only the number of dry batteries intended to be used on the car. Exceeding that number may result in damaging the spark coil, and will burn the vibrator points rapidly, in addition to wasting the batteries.

Keep all electrical connections clean and tight. Keep batteries in a cool, dry place. Extreme heat is as detrimental to batteries as extreme cold. Not less than 1,000 miles should be obtained from one set of five cells of battery, and this will sometimes run as high as 3,000 miles.

### Coils and Vibrators

Wedge the coil tightly in box, so that it will not vibrate. Do not carry any tools or pieces of metal, damp waste or similar material in the coil box, as any one of them may cause a short circuit that will run the batteries down and cause engine to miss.

The adjustment of vibrators should be such as to get a proper spark and consume as little current as possible, which should be not more than 0.5 amp. If the vibrator is adjusted for too much tension the current may run as high as 1.5 amp., which is a useless waste of the battery.

The proper way to adjust the vibrator contact is first to relieve the tension as much as possible by backing out the adjusting screws. Then with the timer contact made, apply the tension gradually by turning the adjusting screw until a reasonably clear buzz is obtained. It is not necessary to have a loud buzz. The tension in the spring should be as weak as possible to get an even spark. It is better to make the adjustment while the car is running, reducing the tension on the spring until the engine misses, and then increasing the tension until it fires evenly. When a vibrator contact is properly adjusted it should not be necessary to change it for a long time. Vibrator points should be accurately matched; and, when necessary, should be dressed lightly in place by use of a platinum point file.

### The Magneto

Be very careful to oil the magneto as directed; an excess of oil is detrimental to the operation of the magneto. Operators will not let any unauthorized person do any work about the magnetos. Maintainers will change out magnetos as necessary, forwarding defective ones to the motor car supervisor. Where magnetos are damaged in wrecks, they should be forwarded to the motor car supervisor without being taken apart.

### The Timer*

The timer should be kept clean and well oiled. Take off the cover occasionally and remove old grease which contains metal, dust and dirt, and which causes short circuits. If the timer bevel contact roller is grooved in one end, reverse it.

Flat balls should be replaced promptly. If you should happen to run out of balls, you can obtain the standard ⅜-in. ball that is used in the Ford automobile.

The timer must be put on right. It must fit well into the recess so that the insulating fibre will not break. The contact posts should be parallel, or nearly so, to the up and down connecting rod to the timer.

The contact in the timer should correspond to about 25-deg. to 30-deg. movement of the wheel. This will be not less than 3 in. nor more than 4 in. in the circumference of the wheel. A greater length of contact is useless and results in a waste of battery. It is most important to have all timer contacts the same length.

To make the contact adjustment, roll the wheel until the buzz starts and make a mark and measure the distance. The length of contact should then be changed by means of raising or lowering the timer insulating ring contact. Lowering this contact makes the contact longer and raising it makes it shorter. The timer insulating ring contact must be screwed up tight when finished to guard against losing it. In setting the timer the cover must be in place to keep the roller in place.

Be sure to get the wires on tight. It is advisable to mark the wires when disconnecting them. After the timer is adjusted with roller and balls in good condition, no further adjustment should be necessary for a long time.

### Spark Plugs

It is better to use the same style spark plug for all cylinders. The points of the spark plugs should be spaced about the thickness of a worn dime and must be the same for all plugs. Plugs should be screwed in snug but not tight. This is especially true when inserting a cold plug into a hot cylinder, as the expansion of the metal may make it impossible to get the plug out without

*These notes refer particularly to Phansteihl coils and Bemus timers, but apply in a general way to other timers.

breaking the threads. If a spark plug is screwed in too tight, it should be taken out when the engine is cool. It is advisable not to remove the plugs from the cylinder as long as the engine fires properly. When taking out, care must be taken to avoid cracking the porcelain. If the porcelain is cracked, it should be replaced.

The adjustment of the points should be made by means of bending the short wire which is attached to the outer shell of the plug. Never bend the center wire which runs the full length of the plug through the porcelain, because any rotation of this center point may give too much or too little space between the points, after the plug has been inserted in the cylinder. Keep the porcelain free from dirt and grease in order to prevent short circuiting.

### Priming

When priming, if the gasoline is drawn into the cylinder instead of being allowed to run in, it will be mixed with air and fired more easily. This is done by moving the piston slightly as the priming charge is poured into the cylinder.

### The Carburetor

Do not tamper with the carburetor. The Schebler carburetor is equipped with an overflow vent which must be left open. Some have had the impression that the vent was a leak and applied a gasket to close the vent.

The needle valve should be about a ¾ turn open. No adjustment of the carburetor should ever be attempted when the engine is cold.

### The Engine

Do not take off the cylinder or cylinder head. Do not run a car with a broken piston ring. The free ends of a broken ring will score the cylinder.

It is not necessary with two-cycle engines to take off the cylinder to clean out the carbon. A smooth coat of carbon in the cylinder is not detrimental to the engine, but if needle like carbon points form they will cause the engine to spit. These needle points of carbon are best removed by filling the cylinder with kerosene at night, while the engine is still warm, and then drain off the kerosene in the morning, treating one cylinder at a time. Before pouring the kerosene through the priming cup, see that the piston is moved so that it completely covers the exhaust port. It is advisable to give the cylinders the kerosene treatment once a week.

A few drops of kerosene on the valve stems while the engine is running will keep the valves moving freely. Never use lubricating oil on the valve stems.

### Oiling

In all internal combustion high speed air-cooled engines a special lubricating oil must be used to get satisfactory results on account of the extreme heat developed.

*Use only the kind of oil specified for your car.* Storekeepers should be cautioned in regard to shipping only oil that is the right grade, and persons operating cars should examine the oil they receive and satisfy themselves that it is the proper grade.

All bearings must be kept tight and well oiled, and grease cups kept filled with the proper grade of cup grease, and the grease must feed properly. When the grease cup is hard to turn, do not assume that the cup has taken a bearing on the grease. It is possible that the cup is not threaded properly, and that proper lubrication is not being obtained. Too much emphasis cannot be placed upon keeping bearings tight and well oiled, as well-oiled bearings insure a smooth running car, and the bearings will last many times longer than if allowed to run dry. If oil for the engine is furnished by a pump, make frequent inspection to see that the oiling system is working.

### Miscellaneous

Exercise care in taking cars off at road crossings to see that the wheels are not clamped in the flange way, and the axle or wheel damaged. This is a matter of great importance. Cars should be run carefully over spring frogs for the same reason.

It requires considerable practice to be able to handle a friction drive car as it should be handled. Do not race the engine. Practice applying the friction and opening the throttle at the same time, and the racing effect will be eliminated.

Each car should carry at all times one extra spark plug. This plug should be clean and properly adjusted, and well wrapped, so that it will be protected against breakage when carried in the tool box, and will always be ready for service when needed.

## Before Laying Rail

By Charles Weiss
Assistant Supervisor, Pennsylvania Railroad.

THE MOST interesting feature of track maintenance is probably the laying of new rail. The biggest part of the work, however, comes before and after the actual renewal of the rail. While efficient methods of performing the work are well worked out as a rule, lack of attention to the preliminary and subsequent operations often nullifies the most careful plans.

The period of preparation is especially important since neglect in any of its details may mean hours of delay in getting the rail in. Where the old rail rests on poor ballast or the joints are bent, it is well to move them back about five feet several days before the rail is to be changed. The local section men can do this easily by cutting the end rails and so bringing the new joints away from muddy or pulverized ballast. The small pieces should be kept on hand for temporary use in case the entire stretch is not renewed in one operation. The section foreman should also locate the new joints, marking them on the ties. On curves, he should mark the location of the shorter rails for the low side and if the rails are all of the same length, he should make the cuts necessary to keep joints opposite centers and see that the short rails are in proper place. An attempt should be made to keep the joints outside of crossings. The low joints should be picked up, leaving a fair surface at least on which to lay the new rail for it does not take many heavy trains to damage new rail seriously if the joints are loose. Rusty bolts should be oiled at least two days before the change, otherwise much time will be lost in loosening them and many of them will have to be cut off. Where the gage is poor, or the tie-plates are cutting into the timber, the ties should be adzed in advance.

The distribution of the material is often more or less slipshod, resulting in great delay at the critical time in getting a spike or a splice from some other part of the job. The section men should attach a pair of splices to the end of each rail with one loose bolt, oiling the inside. The tie-plates, tie-plugs and spikes should be placed in the inter-tie space and the bolts with nut locks attached near the joints. The distribution should be absolutely uniform or there will be either a shortage or a surplus at different points. Furthermore, it will save much time. For example, after the old rail is thrown out, a man can remove the old tie-plates, put in the tie-plugs and, after they have been driven apply the new plates in a perfectly mechanical way. Later the spikers, who usually determine the speed of the job, can follow up and pick up the

spikes from the same relative place and so speed up their work with a minimum of effort. The distribution of all materials should be checked very carefully the day before and small excess supplies left at intervals. The thought is to make each operation as nearly automatic as possible. eliminating unnecessary motion in the same manner that has proved so economical in the case of many trades where attention has been given to this subject.

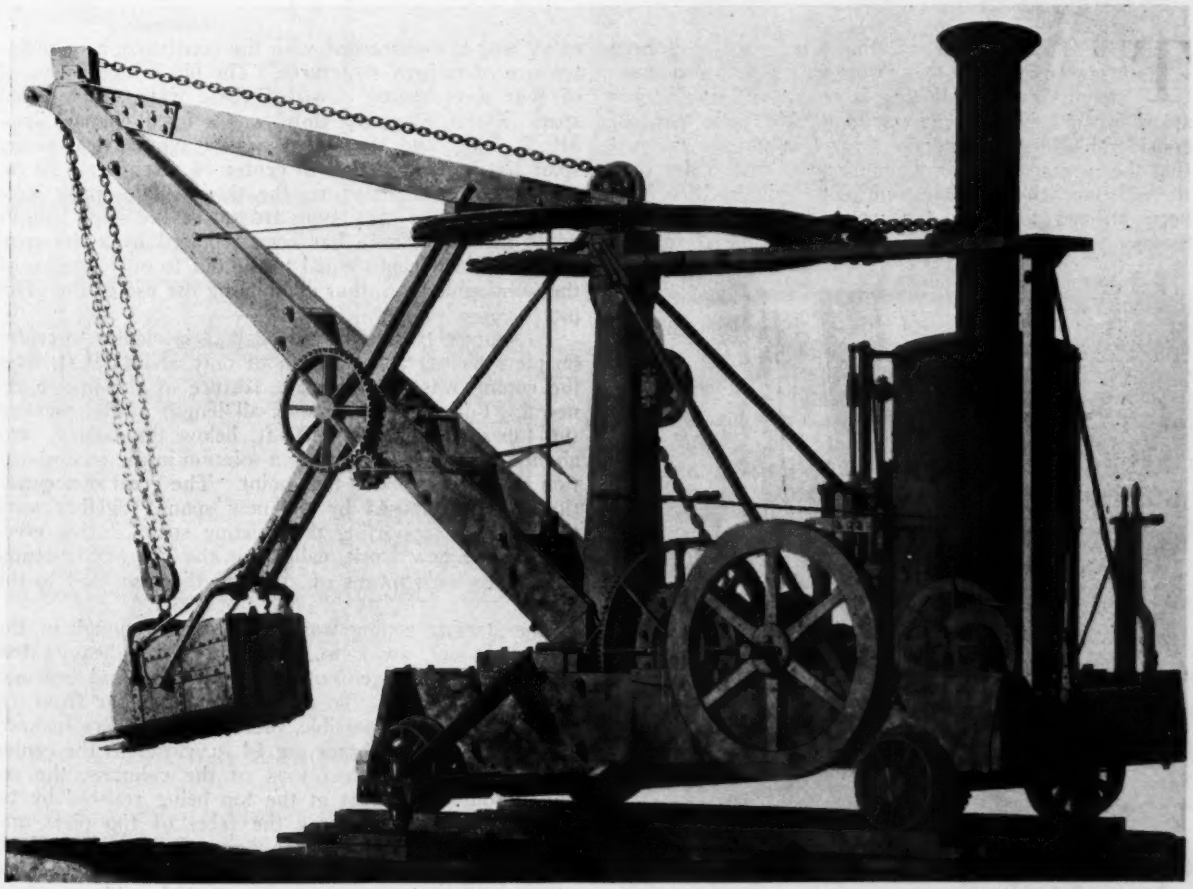
For example, a foreman or assistant should check the pulling of the spikes and see that no stumps or headless spikes are left against the rail as one such stump may hold up the entire gang until a claw bar is brought up and tediously made to remove the inaccessible spike. A few men working ahead of the tong gang can also remove other hindrances, such as rail anchors, gage rods, crossing planks and signal connections. The idea is that the work should proceed just as fast as the tong men can remove the old and replace the new steel. A prime purpose should be to have no loafing but to keep every one busy. Thus if the track may not be broken, more of it can be made ready, being careful not to go beyond the laying limits for the day and leave track unspiked over night. For lack of other work, alternate tie-plates can be replaced with the new ones and the ties adzed and plugged. The track can be surfaced, bolts removed from the existing or removed rail, scrap and surplus material gathered up, the new track ditched or smoothed up, rail anchors applied, etc.

Where the old joints are badly kinked out of line it is a good plan to lay the opposite rail without spiking to gage opposite these kinked joints. Then when the second rail is laid and spiked to gage with the other, there will be no kinks. The gaging should be under the care of a foreman, spiking about every fifth tie with others following between. The entire work is followed up by some reliable man, filling in any missing spikes. As surplus men develop with the completion of certain tasks, they can be put to other work, such as tightening bolts and spiking. The idea is to have everyone working at the same time. A good incentive, after the men begin to get tired, is to promise them that they may quit after doing a certain amount of work, keeping the goal high.

# Early History of the Steam Shovel

THE STEAM SHOVEL is used so universally in railway grading operations that few persons give a thought to the early development of this form of equipment. For this reason the following information which has just become available is of interest:

The "American Steam Excavator," as the first steam shovel was styled in the original patents, was the invention of William S. Otis, the junior member of the firm of Carmichael, Fairbanks & Otis, railway grading contractors. Mr. Otis was the son of an early canal and railroad contractor and when only 19 or 20 years of age began to investigate the feasibility of excavating earth by



**The First Steam Shovel Resembled the Present-Day Shovel in Many Essential Characteristics**

steam, with the result that about 1836 his ideas had crystallized sufficiently for him to have a machine constructed by the firm of Eastwick & Harrison in Philadelphia. This excavator, which is shown in the photograph of a drawing prepared in 1841, was first employed in the grading of a portion of the Baltimore & Ohio line in Maryland which was then under construction. Like most new inventions it required some alterations before it could be worked successfully.

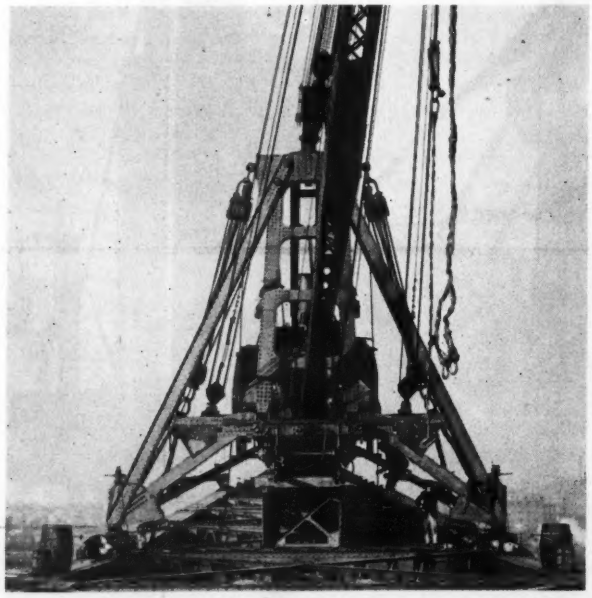
On the completion of this work the excavator was moved to Springfield, Mass., where the firm of Carmichael Fairbanks & Otis had a contract to grade several miles of the Western Massachusetts railway (now a part of the Boston & Albany) extending east from Main street in that city. The steam shovel was installed in a sand cut about one and a half miles east of the city. As the material which was excavated from this cut had to be hauled some distance to form embankments, the contractors borrowed a sufficient amount of iron from the railroad to lay a track on which they placed a small locomotive designed by Mr. Otis and built, according to the best information available, in Worcester, Mass. The weight of this locomotive was about four tons and the gage 3 ft. 2½ in. The engine had an upright multitubular boiler with a square water tank placed in front on the same frame. It had four wheels, each 24 in. in diameter, was inside connected and had oscillating cylinders under the foot board. The wheels were connected by an endless chain with sprocket wheels on the ends of the axles on one side. Some time later this engine was used as a motor for a steam drilling machine by the same contractors on a heavy rock cut on the same road, this being probably the first attempt ever made to drill rock by steam.

The gage of 3 ft. 2½ in. was the result of an accident. A few years before the contracting firm had ordered some small four wheel cars and through an error the machinist fitting up the wheels mounted them on a gage of 3 ft. 2½ in. instead of 3 ft. as was intended. As the contractors were in a hurry for these cars at the time they were accepted and the track was laid to correspond. After that time hundreds of cars and many locomotives were built of this gage for contractors use.

On the completion of the Springfield, Mass., contract the steam shovel was sent to Brooklyn, N. Y., from which point it was taken to Canada where it was employed in excavating the "Deep" cut of the Welland canal, about six miles from Niagara Falls. After completing the widening of the cut above water, it was mounted on a dredge and used to deepen the channel. After the completion of this work the shovel was used as a dredge on the Sioux. It was finally wrecked in 1905 or 1906.

# Bridge Renewel Involves Use of Piers 45 Years Old

THE RENEWAL of the Cincinnati Southern bridge over the Ohio river, which was just completed, involved the replacement of single-track spans erected 45 years ago, with double-track spans of considerably larger proportions. Yet in spite of the fact that the new spans are not only heavier and wider than the old ones, the old limestone piers built in 1876 have been utilized to carry the new superstructure. The manner in which this was accomplished is of interest to all who are concerned with the construction or maintenance of railway structures. The old bridge consisted of four river spans. Two of these were simple fixed spans 300 ft. long, the third was a fixed channel span 519 ft. long, and the fourth was a symmetrical swing span 370 ft. long, center to center of rest piers. In renewing the superstructure, the three single spans have been renewed by continuous trusses of the same lengths while the swing span has been replaced by a lift span having a clear length equal to the out to out distance of the old double span, thus eliminating the use of the pivot pier.



The Derrick Car in Use on Top of the New Steel

To support trusses spaced 32 ft. 4 in. center to center on piers having a top length of only about 28 ft. over the coping was an important feature of the bridge renewal. Fortunately, the over-all length of the piers at the top of the starling, 30 ft. below the coping, was about 42 ft., thereby offering a solution in the reconstruction of the pier above that point. The great concentrations to be imposed by the new spans, together with the need of supporting the existing spans during erection of the new work, called for the use of structural steel bents as a means of applying the new load to the piers.

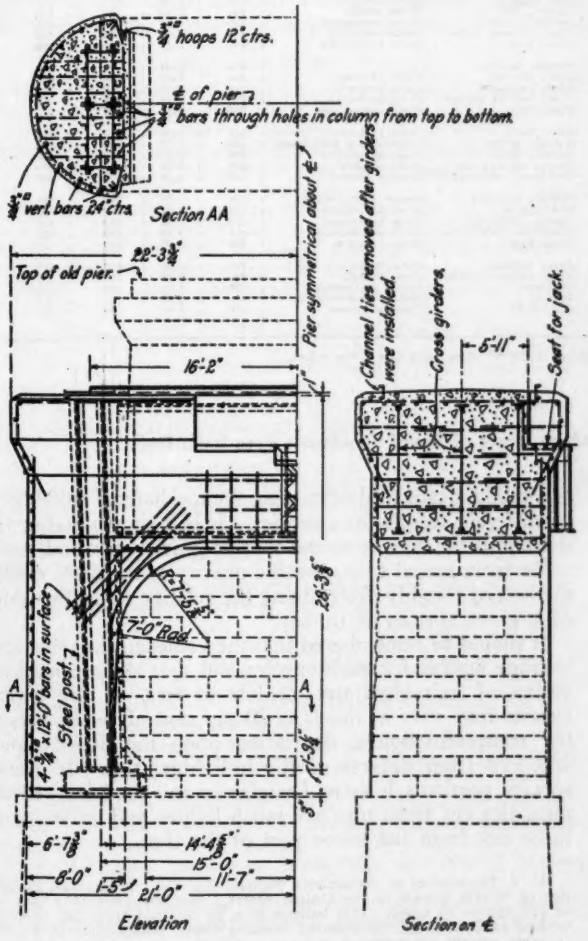
The starling coping was removed and enough of the pier ends cut away to make room for heavy steel columns and grillage footings to take the end bearings of the new trusses. To apply the load as far from the end of the pier as possible, these columns were inclined inward so that the bases are 14 in. closer to the center line of the bridge than tops of the columns, the resultant outward thrust at the top being resisted by tie members extending across the faces of the piers and connecting the tops of each pair of columns. However, application of the superstructure load was further distributed (following the removal of the old spans) by

taking down enough of the pier top between the columns to permit the introduction of three cross girders. These girders serve as diaphragms connecting the two columns of each pair and by wedging them up on the masonry a considerable portion of the column load was distributed to the center portion of the pier.

The top of the piers will be jacketed with concrete to enclose the structural steel and provide a bridge seat and coping. The drawing shows how this will be accomplished with a maximum consideration of the finished appearance of the pier.

At the pier supporting one end of the lift span an additional complication was introduced in providing a seat for the lifting equipment required for the movable span. This necessitated a pair of cantilever girders projecting from the side of the pier as shown in the drawing.

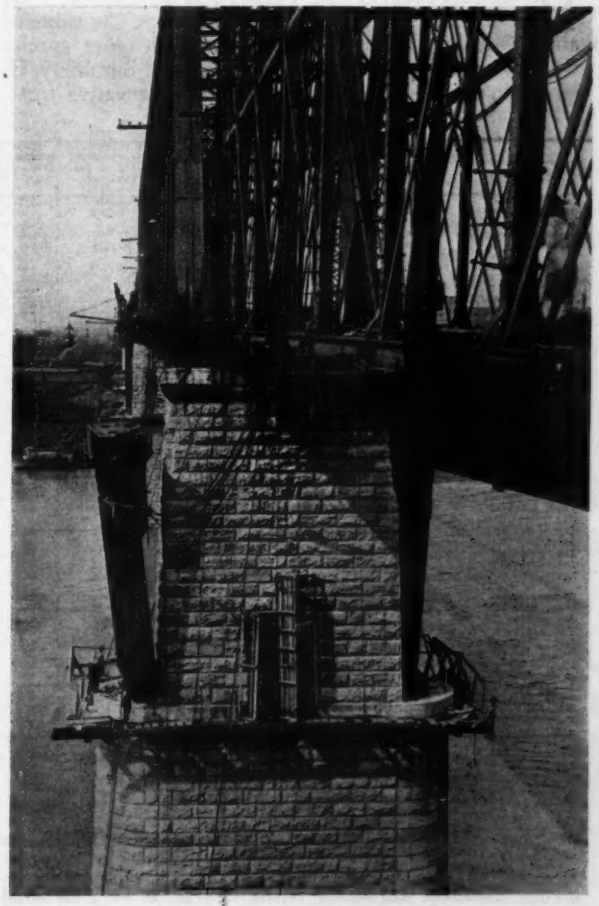
The new bridge was erected around the old one so that it was not necessary to discontinue the use of the bridge for revenue business and, to avoid use of false work, which would have been exceedingly troublesome, the bridge was erected by the cantilever method. Instead of using a creeper traveler, regular derrick cars were used, running on a track supported by bridge




**How the Piers Were Strengthened and Widened**

stringers temporarily erected on the cross struts of the top bracing. The character of this equipment and the method of support are shown in the photograph on the previous page. The only supplementary equipment provided was the A-frame shown in this photograph, by means of which side bearings and tie downs could be provided on the two chords. These side bearings were provided with hydraulically-operated wedge blocks as can be seen in the photograph.

One important problem in connection with this method of erection was to erect the derrick cars at such a high elevation above the operated track, that is, 74 ft. This



**Setting One of the Pier Columns**

was done by building a platform at this level at each end of the bridge and then erecting the derrick cars on this platform, a piece at a time, with the aid of locomotive cranes having 110-ft. booms.

## The Section Foreman's Job

THE SECTION foreman has the most important job on the railroad. When it storms, the dispatcher instructs the operator to "get the section gang." So the foreman gets his men and starts out at any hour of the night to look over his track. When the section foreman is on his usual round of inspection of the station yards the agent says, "Bill, come on over and help us out this morning as our freight is more than we can handle"—so away goes the section foreman to help the agent out of his distress. When a bridge catches on fire and the farmer going home from church sees it, he telephones the agent and the agent calls the section men. When a critter is killed, who has to go and bury it—the section men.

*From a talk made by M. Cronin, section foreman at a division staff meeting on the Chicago, Rock Island & Pacific at Des Moines, Iowa, on April 12.

# The Mechanical Properties of Woods Used for Crossties

By P. R. Hicks

Formerly Engineer in Forest Products, Forest Products Laboratory, Madison, Wisconsin.

PRACTICALLY every commercial species of wood is of some value for making crossties. The value of any particular species in comparison with other species will, however, be determined by its natural durability, its strength, and its capacity for taking preservative treatment. Natural durability is, of course, a very decided advantage, but its absence can be overcome by the use of a preservative.

The fact that durability may be controlled within certain limits makes the mechanical properties of a species of chief importance when its availability for crossties is being considered. In the December, 1920, issue of the *Railway Maintenance Engineer* the author discussed the mechanical properties of western tie species. The present article gives data on the suitability, from the standpoint of their strength properties, of all the tie species included in the specifications adopted by the National Association of Railway Tie Producers, in January, 1921, and by the American Railway Engineering Association in March, 1921.

Three properties of wood are of special importance in determining its mechanical suitability for crossties: (1) its bending strength, or ability to resist ordinary strains due to center binding; (2) its end hardness and strength in compression parallel to the grain, which are measures of its resistance to spike pulling and the lateral pressure of spikes; and (3) its side hardness and compression perpendicular to the grain, which govern its ability to resist rail or plate wear.

In the accompanying table the different species have been listed in the order of their suitability for tie material, this suitability being expressed by a "composite figure" (See paper entitled "Discussion on Woods Suitable for Crossties," by Carlile P. Winslow and John A. Newlin, in the Proceedings of the American Wood Preservers' Association, 1916, pp. 238 to 247.) which is a weighted combination of the strength values mentioned above. The strength values were obtained from many thousands of tests on small, clear specimens of wood, tested green and air-dry. Specific gravity, compression perpendicular to the grain, and side hardness are also shown in the table.

It will be noted that the strength values and the specific gravities have the same general trend as the composite figures. Hence the specific gravity might easily be used as a ready means of determining the mechanical suitability of different woods for crossties. It is a simple matter to determine the density or the specific gravity of wood, and, aside from actual tests, specific gravity is the most ready method of roughly determining the relative strength value of a given species of timber.*

It should be remembered that the values in the table are average figures for each species and that the mechanical values of individual ties, or lots of ties, of any given species may vary as much as 30 per cent above or below the composite figure, depending upon the density and freedom from defects of the individual ties. In some species, particularly coast Douglas fir and southern yellow pine, ties cut from tops are much lighter and softer than those cut from the lower part of the tree.

| Species | | Composite figure | Specific gravity | Compression perpendicular to grain (lbs. per sq. in.) | Side hardness (lbs. per sq. in.) |
|---|---|---|---|---|---|
| Common name | Botanical name | | | | |
| Locust, black | Robinia pseudacacia | 1,635 | 0.66 | 1,430 | 1,570 |
| Hickory, pignut | Hicoria glabra | 1,475 | 0.66 | 1,140 | --- |
| Hickories, true | | 1,400 | 0.64 | --- | --- |
| Hickory, shagbark | Hicoria ovata | 1,365 | 0.64 | 1,000 | --- |
| Gum, blue | Eucalyptus globulus | 1,350 | 0.62 | 1,020 | 1,340 |
| Hickory, mockernut | Hicoria alba | 1,340 | 0.64 | 1,000 | --- |
| Hickory, bitternut | Hicoria minima | 1,310 | 0.60 | 990 | --- |
| Hickory, water | Hicoria aquatica | 1,305 | 0.61 | 1,090 | --- |
| Hickory, big shell bark | Hicoria laciniosa | 1,286 | 0.62 | 1,000 | --- |
| Hickories, pecan | | 1,255 | 0.60 | --- | --- |
| Locust, honey | Gleditsia triacanthos | 1,255 | 0.58 | 1,420 | 1,390 |
| Hickory, pecan | Hicoria pecan | 1,225 | 0.60 | 960 | --- |
| Hickory, nutmeg | Hicoria myristicaeformis | 1,185 | 0.56 | 940 | --- |
| Ash, blue | Fraxinus quadrangulata | 1,125 | 0.53 | 990 | 1,030 |
| Ash, commercial white | | 1,080 | 0.53 | --- | --- |
| Ash, green | Fraxinus lanceolata | 1,070 | 0.52 | 910 | 870 |
| Maple, sugar | Acer saccharum | 1,065 | 0.56 | 760 | 910 |
| Oak, white | Quercus alba | 1,040 | 0.59 | 830 | 1,060 |
| Ash, biltmore | Fraxinus biltmoreana | 1,035 | 0.51 | 880 | 850 |
| Birch, sweet | Betula lenta | 1,030 | 0.59 | 580 | 890 |
| Elm, cork | Ulmus racemosa | 1,020 | 0.58 | 780 | 990 |
| Walnut, black | Juglans nigra | 996 | 0.51 | 600 | 900 |
| Pine, Cuban | Pinus heterophylla | 982 | 0.58 | 690 | 630 |
| Oak, commercial red | | 970 | 0.56 | 730 | 950 |
| Pine, longleaf | Pinus palustris | 960 | 0.60 | 600 | 890 |
| Birch, yellow | Betula lutea | 950 | 0.54 | 450 | 740 |
| Beech | Fagus atropunicea | 935 | 0.54 | 610 | 820 |
| Ash, pumpkin | Fraxinus profunda | 930 | 0.48 | 990 | 750 |
| Ash, Oregon | Fraxinus oregona | 900 | 0.50 | 650 | 790 |
| Maple, red | Acer rubrum | 845 | 0.48 | 820 | 660 |
| Cherry, black | Prunus serotina | 840 | 0.47 | 440 | 860 |
| Pine, shortleaf | Pinus echinata | 815 | 0.50 | 480 | 560 |
| Gum, cotton | Nyssa aquatica | 810 | 0.46 | 590 | 710 |
| Elm, slippery | Ulmus pubescens | 810 | 0.48 | 510 | 660 |
| Larch, western | Larix occidentalis | 800 | 0.48 | 560 | 450 |
| Douglas fir[1], coast | Pseudotsuga taxifolia | 795 | 0.48 | 530 | 470 |
| Maple, Oregon | Acer macrophyllum | 790 | 0.44 | 550 | 620 |
| Gum, black | Nyssa sylvatica | 775 | 0.46 | 600 | 640 |
| Cedar, Port Orford | Chamaecyparis lawsoniana | 730 | 0.41 | 360 | 480 |
| Gum, red | Liquidamber styraciflua | 715 | 0.44 | 460 | 520 |
| Sycamore | Platanus occidentalis | 700 | 0.46 | 450 | 610 |
| Spruce, Norway | Pinus resinosa | 700 | 0.44 | 360 | 540 |
| Cypress, bald | Taxodium distichum | 690 | 0.41 | 470 | 580 |
| Ash, black | Fraxinus nigra | 680 | 0.46 | 430 | 580 |
| Pine, pitch | Pinus rigida | 680 | 0.47 | 510 | 480 |
| Hemlock, black | Tsuga mertensiana | 675 | 0.42 | 400 | 460 |
| Hemlock, western | Tsuga heterophylla | 670 | 0.38 | 350 | 480 |
| Maple, silver | Acer saccharinum | 670 | 0.44 | 460 | 590 |
| Hemlock, eastern | Tsuga canadensis | 660 | 0.38 | 500 | 410 |
| Douglas fir (Rocky Mt.) | Pseudotsuga taxifolia | 655 | 0.40 | 450 | 400 |
| Sassafras | Sassafras sarsafras | 650 | 0.42 | 460 | 520 |
| Cypress, yellow | Chamaecyparis nootkatensis | 630 | 0.40 | 410 | 410 |
| Cedar, incense | Libocedrus decurrens | 620 | 0.33 | 460 | 390 |
| Birch, paper | Betula papyrifera | 600 | 0.47 | 300 | 490 |
| Fir, grand | Abies grandis | 595 | 0.37 | 340 | 360 |
| Chestnut | Castanea dentata | 590 | 0.40 | 380 | 420 |
| Fir, white | Abies concolor | 590 | 0.35 | 440 | 330 |
| Spruce, red | Picea rubens | 590 | 0.38 | 350 | 360 |
| Spruce, Sitka | Picea sitchensis | 590 | 0.34 | 330 | 370 |
| Pine, western white | Pinus monticola | 585 | 0.39 | 300 | 330 |
| Pine, jack | Pinus divaricata | 570 | 0.39 | 380 | 370 |
| Spruce, eastern | | 565 | 0.37 | --- | --- |
| Pine, Jeffrey | Pinus jeffreyi | 565 | 0.37 | 380 | 340 |
| Pine, lodgepole | Pinus contorta | 560 | 0.38 | 310 | 330 |
| Pine, western yellow | Pinus ponderosa | 555 | 0.38 | 340 | 320 |
| Pine, sugar | Pinus lambertiana | 550 | 0.36 | 360 | 320 |
| Pine, white | Pinus strobus | 550 | 0.36 | 310 | 300 |
| Poplar, yellow | Liriodendron tulipifera | 545 | 0.37 | 310 | 340 |
| Spruce, white | Picea canadensis | 535 | 0.36 | 370 | 290 |
| Cedar, western red | Thuja plicata | 525 | 0.31 | 310 | 260 |
| Butternut, white walnut | Juglans cinerea | 520 | 0.36 | 270 | 390 |
| Cherry, wild red | Prunus pennsylvanica | 515 | 0.36 | 360 | 390 |
| Fir, alpine | Abies lasiocarpa | 470 | 0.31 | 310 | 280 |
| Spruce, Engelmann | Picea engelmanni | 435 | 0.31 | 290 | 240 |
| Cedar, northern white | Thuja occidentalis | 415 | 0.29 | 290 | 250 |
| Pine, pond | Pinus serotina | 800 | 0.50 | 640 | 510 |
| Pine, loblolly | Pinus taeda | 790 | 0.50 | 550 | 480 |
| Pine, table mountain | Pinus pungens | 780 | 0.49 | 560 | 490 |
| Hackberry | Celtis occidentalis | 735 | 0.48 | 490 | 490 |
| Redwood | Sequoia sempervirens | --- | 0.41 | 520 | 460 |
| Elm, white | Ulmus americana | 700 | 0.44 | 390 | 550 |

[1] Values given for Coast Douglas fir are averages for all grades. Selected material of "Dense" grade would give higher values.

[2] Based on volume when green and weight when oven dried.

[3] Values for green material.

**Mechanical Properties of Various Tie Species Based on Tests of Small Specimens Free from Defects**

*U. S. Department of Agriculture Bulletin No. 556, "Mechanical Properties of Woods Grown in the United States," lists the strength properties of 126 species of wood. This bulletin may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 10 cents, stamps not accepted.

UNSCRAMBLED.—In a decision on May 29, the United States Supreme Court ordered the severance of the Southern Pacific's control of the Central Pacific by stock ownership, or by lease. This decision is based upon the principle that for the best interests of the country the two roads should be operated as competitive systems.

# Labor Board Makes Further Cuts in Pay

## Decisions on Contracting of Maintenance of Way Work Given Out Late Last Month

FURTHER reduction in the wages of other classes of railway employees, announced since the date on which the cut in pay of maintenance of way employees was announced, now cover practically all classes of employees except those represented by the "Big four" brotherhoods. On June 6, the board announced the reduction in the wages of the shop craft employees and a few days later a reduction for clerical and miscellaneous forces. In general, the reductions to these classes of employees have been as large, if not larger, than those imposed on the employees of the maintenance of way department.

In the case of the shop crafts, a reduction of seven cents an hour was authorized for machinists, boilermakers, blacksmiths, metal workers, electrical workers, car men (except freight car men), moulders, cupola tenders, die makers, regular and helper apprentices, etc., and a reduction of nine cents an hour for freight car men and five cents an hour for car cleaners. The reduction for other classes of employees is listed below:

CLERICAL AND STATION FORCES

Sec. 1. Storekeepers, assistant storekeepers, chief clerks, foremen, sub-foremen, and other clerical supervisory forces...3 cents

Sec. 2. (a) Clerks with an experience of two or more years in railroad clerical work, or clerical work of a similar nature in other industries, or where their cumulative experience in such clerical work is not less than two years.....3 cents

(b) Clerks with an experience of one year and less than two years in railroad clerical work, or clerical work of a similar nature in other industries, or where their cumulative experience in such clerical work is not less than one year.....4 cents

Sec. 3. (a) Clerks whose experience as above defined is less than one year .....4 cents

(b) Clerks without previous experience hereafter entering the service will be paid a monthly salary at the rate of $60 per month for the first six months, and $70 per month for the second six months.

Sec. 4. Train and engine crew callers, assistant station masters, train announcers, gatemen and baggage and parcel room employees (other than clerks).....3 cents

Sec. 5. Janitors and elevator operators, office, station and warehouse watchmen and employees engaged in assorting way bills and tickets, operating appliances or machines for perforating, addressing envelopes, numbering claims and other papers, gathering and distributing mail, adjusting dictaphone cylinders and other similar work .....4 cents

Sec. 6. Office boys, messengers, chore boys and other employees under eighteen years of age, filling similar positions and station attendants .....4 cents

Sec. 7. Station, platform, warehouse, transfer, dock, pier, store room, stockroom and team track freight handlers or truckers and others similarly employed.....4 cents

Sec. 8. The following differentials shall be maintained between truckers and the classes named below:

(a) Sealers, scalers and fruit and perishable inspectors, one cent per hour above truckers' rates as established under Section 7.

(b) Stowers or stevedores, callers or loaders, locators and coopers, two cents per hour above truckers' rates as established under Section 7.

The above shall not operate to decrease any existing higher differentials.

Sec. 9. All common laborers in and around stations, storehouses and warehouses, not otherwise provided for.....4 cents

STATIONARY ENGINE (STEAM) AND BOILER ROOM EMPLOYEES

Sec. 1. Stationary engineers (steam).....2 cents
Sec. 2. Stationary firemen and engine room oilers.....2 cents
Sec. 3. Boiler room water tenders and coal passers.....2 cents

ARTICLE IX—SIGNAL DEPARTMENT EMPLOYEES

Sec. 1. Signal foremen, assistant signal foremen, and signal inspectors .....No reduction
Sec. 2. Leading maintainers, gang foremen, and leading signalmen .....5 cents
Sec. 3. Signalmen, assistant signalmen, signal maintainers, and assistant signal maintainers .....5 cents
Sec. 4. Helpers .....6 cents

## Board Issues Decision in Maintenance Contracting Case

On June 26, the board issued its first decisions with respect to the contracting of maintenance of way work, these being cases involving the Indiana Harbor Belt and the Chicago Great Western. The board at the same time rendered decisions on a number of other cases involving other classes of employees and in all the decisions rendered the finding corresponded to that given out on May 10, with respect to the contracting of work in the Indiana Harbor Belt locomotive and car shops, namely, that the contracting is in violation of the Transportation Act, insofar as is construed to remove the employees from the application of the act.

The decision in the maintenance of way case relating to the Indiana Harbor Belt concerns the contracting of all maintenance of way work to Colianni & Dire, in the spring of 1921 as reported in a hearing concerning this case in the Railway Maintenance Engineer for January, 1922, page 19. The distinctive features of this contract will be noted from the paragraphs noted below:

The contractor agrees to make necessary track repairs and do other work on the right of way of the railroad ordinarily done by track gangs, at such places as the railroad may hereafter designate, in accordance with instructions of the roadmaster of the railroad or his authorized assistant. No repairs may be made except as authorized by the said roadmaster.

Tools, equipment and supplies necessary to carry on said work shall be furnished by the railroad.

The railroad will maintain and own the material stock, it being understood that such material will be subjct to supervision and inspection of the railroad's storekeeper.

All labor necessary to properly maintain the tracks and right of way on the sections above designated, or which may hereafter be designated by the railroad, shall be carried on the payrolls of the contractor and paid by said contractor, reimbursement to be made by monthly collection bill against the railroad. The contractor shall keep accurate accounts of the services and expenses in a manner satisfactory to the railroad, to which accounts the railroad shall have access at all resonable times for purposes of verification.

As compensation to the contractor in return for the work performed and for the use of his working capital, there shall be added to each monthly bill for labor charge an addition of five per cent. The remuneration, as hereinbefore provided, shall be accepted by the contractor in full payment for work performed by his employees under this agreement.

In executing this contract, the railroad notified its track laborers of the contracting arrangement and discharged them. The track foremen were retained for a time on the payroll of the railroad but were eventually turned over to the contractor. The decision of the board is as follows:

### Opinion

The employees contend:

(1) That the contracts involved herein are not in good faith but are merely subterfuges designed to evade the provisions of the Transportation Act and the decisions of the Railroad Labor Board; and

(2) That even if the contracts are in good faith they are in violation of the Transportation Act and in conflict with the decisions of the Railroad Labor Board.

The board is of the opinion that the employees failed to substantiate their contention that the contracts are actually fraudulent and that they are mere subterfuges contrived to evade the Transportation Act. Obviously they do evade the act but the carrier contends that it is not in violation of the law.

In a previous decision (No. 982, dated March 9, 1922), the board expressed its opinion in regard to the general principles involved in the contracting of work by carriers and the opinion as therein expressed applies in this case.

### Decision

The Railroad Labor Board decides:

(1) That the contract entered into between the Indiana Harbor Belt Railroad and Colianni & Dire for the maintenance of track and right of way is in violation of the Transportation Act, 1920, insofar as it purports or is construed by the carrier to remove said employees from the application of said Act, and that the provisions of the contract affecting the wages and working rules of said employees are in violation of Decisions Nos. 2, 119 and 147 of the Railroad Labor Board.

(2) That the employees performing track maintenance work of said contractor are under the jurisdiction of the Railroad Labor Board and subject to the application of the Transportation Act of 1920 and Decision No. 147.

(3) The carrier is directed to take up with any employees the matter of reinstatement upon the applicatian of the interested employee or his representative.

A similar decision was rendered with respect to the contracting of maintenance of way work on the Chicago Great Western to the A. S. Hecker Company, of Cleveland, Ohio. In this case, the contractor provided an extra gang on the eastern division of the Chicago Great Western with men paid at the rate of 31 cents per hour. The decision of the board corresponds in substance with that rendered in the case of the Indiana Harbor Belt.

### Sheet Metal Workers Under Jurisdiction of Shop Crafts

Two cases were brought before the Labor Board regarding employees of the Northern Pacific working under the jurisdiction of the master carpenters. One of these was a sheet metal worker repairing down spouts, gutters, etc., on buildings; the other was in water service, performing various kinds of pipe work, including some involving the use of sheet metal. The contention of the employees is that these men were performing the work of tinsmiths and should, therefore, be classified and rated in accordance with Rule 126 of the Shop Crafts' Agreement.

The carrier conceded that the employees in question performed certain tinner's work, but contended that this work was performed in connection with buildings and water service facilities maintained by the mantenance of way department, and that, in addition to the tinner's work, they performed such other work of mechanics in the maintenance of way department as was assigned to them from day to day.

The decision of the board is that these two men are sheet metal workers in a sense that this term is understood and that they are properly under the jurisdiction of the railway employees department of the A. F. of L. A dissenting opinion in both of these cases was signed by J. H. Elliott and Horace Baker. This dissenting opinion points out definitely that these men were employed in the bridge and building department and have served in that capacity for several years. They also show that the character of work done in the bridge and building and the locomotive departments are entirely different and that the line of demarcation between employment in these two departments has long been kept distinct. In their opinion there is bound to be confusion if the work of the two departments is not kept separate. Some excerpts of the dissenting opinion for one of these cases (the two being very similar) are given below:

"One entirely familiar with maintenance of way service will readily agree that the character of the service necessary in connection with the maintenance of water service equipment and in the performance of tinning and plumber's work in the maintenance of way department is not comparable with the service of pipe fitters, coppersmiths, tinners and sheet-metal workers employed in and around shops and shop yards primarily in connection with the maintenance and repair of rolling stock.

"The service last mentioned, as is stated under the rule, providing for qualifications of sheet-metal workers, requires the service of a competent mechanic of the sheet-metal trade, while the service performed in the maintenance of way department, such as that performed by the employee involved in this dispute, does not require the qualifications as provided for a sheet-metal worker in the maintenance of equipment department, nor does it require the services of one who is an expert mechanic of that trade. This has been clearly demonstrated by experience.

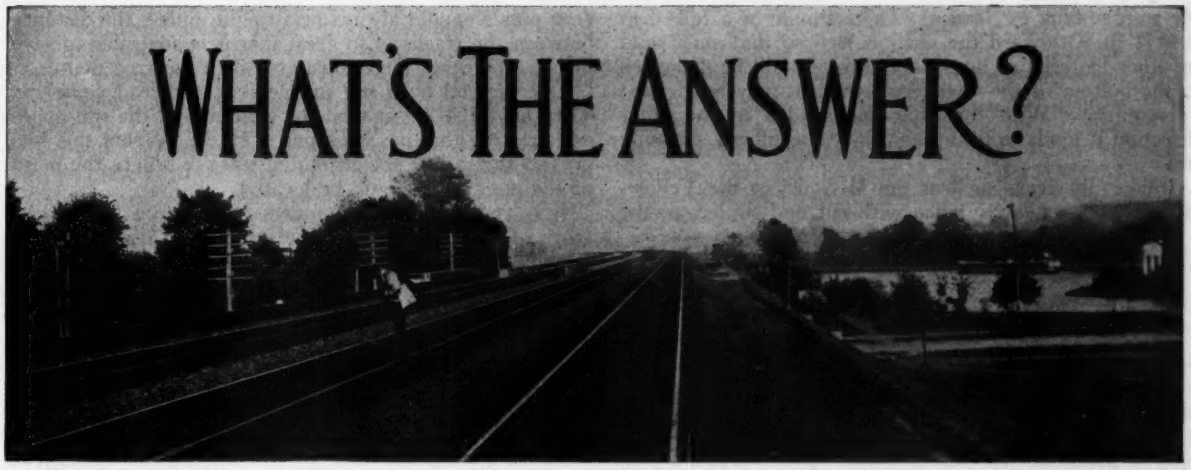
"Prior to the period of Government control of railroads there was a definite and recognized line of demarcation as between mechanics of the shop trades and mechanics of the maintenance of way department; this line of demarcation, having grown up through years of experience,clearly dictated that the service of the employees in the two departments was not comparable. Only in rare instances were employees of the maintenance of way department classified and paid as shop mechanics, and then only in cases where exceptional skill was required for the service in the maintenance of way department.

"The evidence submitted in this case clearly shows that the employee in question is performing service which has been recognized as that coming within the jurisdiction of the maintenance of way department and which has in the past been performed by employees of that department." Decisions No. 946 and 947.

### Pay of Foremen During Time Laid Off

During the months of February, March and April, an extra gang foreman on the Buffalo, Rochester & Pittsburgh was in charge of a gang that was laid off one day each week and the foreman was not himself required to work on those days. Because the railroad made a deduction from his pay for these periods not employed, the United Brotherhood of Maintenance of Way Employees and Railway Shop Laborers entered a case before the Labor Board asking that the man be reimbursed for the deduction made on the days not employed. The contention of the employees was that these foremen are supervisory employees on a monthly wage covering all services rendered. The carriers' contention was that inasmuch as the railroads are compelled to pay these monthly employees additional compensation for overtime, Sunday work, etc., they are within their rights in deducting from their pay for any time lost. The decision of the board is that if the foreman is compensated on a monthly basis for all service rendered, then such a foreman should receive not less than a monthly wage so established, providing he was ready and available to perform the service required. If, however, the foreman is compensated on a monthly basis but is paid overtime for work performed after eight hours and all work performed on Sundays and holidays, no valid claim can be made for lost time. Decision No. 896.

# WHAT'S THE ANSWER?



This department is an open forum for the discussion of practical problems of maintenance of way and structures. Readers are urged to send in any questions which arise in their work in the maintenance of tracks, bridges, buildings and water service. The *Railway Maintenance Engineer* also solicits the co-operation of its readers in answering any of the questions listed below.

**The following questions will be answered in next month's issue:**

(1) *What is the best way to protect from fire creosoted ties or timbers stored along the tracks?*
(2) *If piles of creosoted ties or timbers have caught fire what is the best way to fight the fire?*
(3) *In referring to boiler waters what is the correct relation between pounds per 1,000 gal., parts per 100,000 and grains per gallon?*
(4) *Is there any objection to the presence of trees or brush on the right of way if they do not obscure the view along the track?*
(5) *What is the purpose of a nut lock?*
(6) *Is it practicable to cut a rail with a cold chisel without removing it from track?*
(7) *When finishing the top of concrete work, is it desirable to apply a somewhat richer mixture to aid in giving a good top surface with a trowel or float?*
(8) *How should a concrete floor be made to prevent it from "dusting"?*

## Heating Reinforcing Bars

*Is there any objection to the heating of reinforcing bars for the purpose of making bends?*

Unfortunately the specifications of the American Railway Engineering Association for reinforced concrete and the tentative report of the Joint Committee on Concrete and Reinforced Concrete are silent on this point. There are cases of complex reinforcing where sharp bends are shown on the drawings so that the man in the field is strictly "up against it" if he is not permitted to heat the bars before bending them. However, it is a practice that should be avoided wherever possible. The lack of adequate facilities and a skilled blacksmith to do the heating means that in most cases the work will be done under unfavorable conditions. Consequently there is danger that the bars will be burned or otherwise injured. There is also danger of setting up internal stresses due to irregular heating or cooling.

## Waterworks Intakes

*What is the best method of protecting the intake of a pumping plant taking water from a stream or reservoir to keep out drift or other floating matter?*

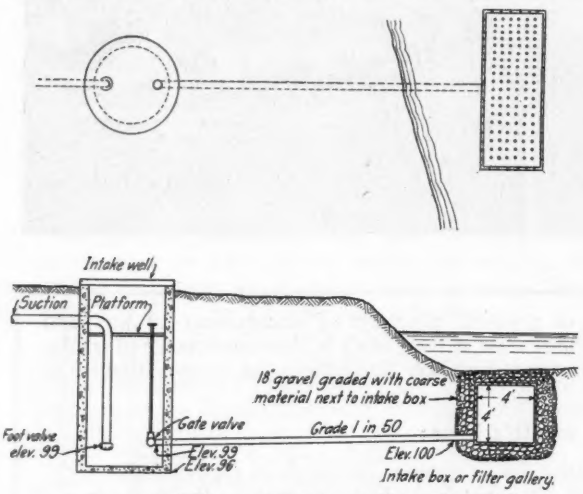
Where the reservoir is simply an open excavation or natural basin with more or less soft material at the bottom, it is a good plan to spread about 2 cu. yds. of field boulders or rip rap stone at the point in the reservoir bed where the end of the intake will rest. This will prevent the soft material on the bottom from being stirred up and drawn into the suction pipe by the action of the pump. To prevent floating debris from being drawn into the suction line, a frame made of 2-in. by 4-in. lumber, about 4 ft. long and 18 in. square and covered on all sides with heavy wire netting with about ¼-in. mesh, making a rectangular strainer may be slid over the end of the pipe and fastened in place. Leaves or other floating debris may collect on one side or another of this strainer at different times but water may still enter at some other part. Strainers of this kind in use prove very satisfactory and are particularly desirable where trouble is experienced with fish getting into the pipe line.

Where water is taken from a stream heavily laden with silt or other material a satisfactory arrangement can usually be made by placing a filter gallery below the bed of the stream as illustrated in the sketch. The location for this filter gallery should be selected with care so as to have it at a point in the bed of the stream where the formation of sand bars is unlikely.

This gallery consists of a substantial timber box perforated on all sides with ½-in. or ¾-in. holes and surrounded with about 18 in. of gravel graded from rock an inch or larger next to the box down to coarse sand at the outside. The stream passing over the gravel surface above the box tends to keep it washed clean, but if clogging of the gravel filling does occur, the gallery may be flooded with clear water under pressure from

the storage tank to clean it. There should be a fall of at least 1 in 50 toward the suction well so that such sand or other material as does filter through will be deposited in the bottom of the well from which it may be cleaned as required. With the pipe line graded in the other direction it tends to fill up and makes a difficult cleaning job.

Intakes in rivers such as the Missouri or the Yellowstone that are heavily laden with silt and subject to the rapid formation of sand bars often constitute a serious problem and the location of the entire pumping plant should often be secondary to the selection of the proper site for the suction intake so that there may be no trouble from high or low water, ice or shifting sand.




**A Suggested Form of Intake to Keep Out Drift**

EDWIN M. GRIME,
Supervisor Bridges and Buildings, Northern Pacific, Fargo, N. D.

## Length of Crossovers

*How is the distance between points of frogs in crossovers determined?*

### First Answer

Find the distance between the center lines of tracks; from this subtract twice the gage, and multiply the remainder by the number of the frog used. The result will be the distance between the theoretical points of frogs.

In case frogs of different angles are used, add the two frog numbers and divide by two, multiply in the same manner and result will be the distance desired.

A. W. WEHNER,
Roadmaster, Southern Pacific Lines, Lake Charles, La.

Note: This method is not theoretically correct but it gives results that are sufficiently accurate for all practical purposes for ordinary frog angles. For the larger frog numbers such as No. 15 or No. 16 the results are practically exact. The reader is referred to any of the ordinary field books when it is desired to compute this distance mathematically correct. The correction to get the distance between actual points of frog is variously given but the more common answer is to subtract from the distance between the theoretical points of frogs a number of inches equal to the frog number. This assumes that the point is ½-in. wide.—Editor.

### Second Answer

The frogs are usuallly, though not necessarily, of the same number. However, in ordinary crossovers between straight and parallel tracks, it is desirable that they should be of the same number since the line between the frog points should always be straight, unless the distance between the tracks is so great that it is advisable to save distance by reversing midway between the frog points.

One method is to put in one frog and lead complete. Then hold a string against the gage line of the rail opposite the frog that has been put in track. Where this line crosses the rail of the adjoining track is where the point of the next frog should be located.

It is customary in crossovers on a curve to use two frogs of the same number the same as on tangent, but a straight line between frogs can be obtained if the proper combination of frogs is used. The number of the frog on the inside of the curve, except in frogs less than No. 8, is always less than that upon the outside when there is a straight line between them, and this frog number decreases as the curvature and distance between the track increases. On account of the wide difference in the curvature of tracks to be united by crossovers upon curves, it is impossible to give a simple practical rule to find the difference between frogs. Therefore, for expeditious and accurate work the intelligent use of a frog board, a ball of twine and a metallic tape will be found indispensable and should be used in every case of difficulty and uncertainty, as frogs should never be located carelessly.

J. W. POWERS,
Supervisor, New York Central, Rochester, N. Y.

Note: Where crossovers are located on curved track, or where the crossover connects frogs of, different angles, mathematical computations of considerable difficulty may arise. It is therefore usually advisable to arrange for the more complicated crossovers of this kind to be staked out by engineers with a transit and tape.—EDITOR.

Additional replies were received from J. Rash, yard foreman, Rock Island Lines, Dalhart, Texas; J. C. Wright, section foreman, Southern Pacific, Unice, La.; F. A. Elescke, section foreman, Southern Pacific, Niles, Cal.; and Joseph De Raymond, section foreman, Lehigh Valley, Easton, Pa.

## Pounds to the Ton

*How many pounds in a ton of rail and in a ton of tie plates?*

In this country the ton is usually one of 2,000 lb., whereas in England it is almost invariably 2,240 lb. One important exception to the 2,000-lb. rule in America is found in the case of steel rails, which are sold in tons of 2,240 lb. This also applies to rail scrap, including frogs, switches, etc. Tie plates, structural steel, angle bars, etc., and practically all other iron and steel items are purchased by the short or net ton of 2,000 lb.

## Killing Dandelions

*Is digging the only way to get dandelions out of station grounds lawn?*

Considerable success is reported from the use of sulphate of iron, a cheap chemical that can readily be obtained. This treatment has the effect of blackening the grass so that the lawn will be discolored until the new grass has grown and receives two or three cuttings. The following is a quotation from Bulletin 466 of the New York Agricultural Experiment Station:

"Dandelions may be eradicated from lawns at relatively slight expense and without material injury to the grass by proper spraying with a sulphate of iron solution. The first spraying should be made just before the first blooming period. One or two others should follow at intervals of three to four weeks, and finally one or two more in the late summer and fall. During the hot,

dry weather of midsummer spraying should be discontinued, because of danger of injury to the grass.

"A conspicuous blackening of the lawn which follows each application soon disappears, if the grass is growing vigorously. Of the other common lawn weeds, some are killed while others are injured slightly by the application. Unfortunately white clover is killed. Spraying should be supplemented by the sowing of grass seed and the application of fertilizers in the spring and fall each year. With proper management it is necessary to spray only about every third year in order to keep a lawn free from dandelions.

"The spraying solution is made by dissolving 1½ lb. in a gallon of water and a gallon is used to 375 sq. ft. It must be applied under pressure in a fine mist; sprinkling cans will not do. The liquid will stain clothing, metals, cement and stone, so care must be used in handling it. The sprayer should be washed well after using to prevent rusting."

## Cracked Paint

*What causes alligatoring of a paint surface?*

The following answer is given in "Corrosion and Preservation of Iron and Steel," by Cushman & Gardner. "An accurate explanation of the phenomenon spoken of as alligatoring is not easy to get but it probably depends on a superficial hardening of the outer or skin surface of the coating underneath which still remains to some extent plastic and elastic." These conditions would arise where paint was applied in excessively hot, dry weather or where the coating was applied too heavy. Of course, improper or adulterated materials might lead to difficulties of this kind but a discussion of the chemistry of paint is necessarily beyond the province of this department.

## Creosote Poisoning

*Can a man be poisoned in handling creosoted timbers?*

### First Answer

While coal-tar creosote is sufficiently poisonous to wood-destroying fungi to prevent their development, it is not poisonous to persons coming in contact with it. It is, in fact, a powerful antiseptic and germ killer, and is extensively used as such. If applied to cuts or open wounds, however, it may cause some irritation, and to some persons creosote vapors occasionally cause slight discomfort similar to sun burn. It can, therefore, be safely said that those who handle treated timber are in no danger of actual poisoning from the creosote.

P. R. HICKS,

Secretary-Manager Service Bureau, American Wood Preservers' Association, Chicago.

### Second Answer

My opinion is that a man cannot be poisoned from handling creosoted timbers. During an experience of three years in charge of a timber-treating plant, I have creosoted approximately 2,000,000 cross ties, 20,000,000 ft. b. m. of switch ties and lumber. All of the cross ties and switch ties, and perhaps 20 per cent of the treated lumber, was loaded by hand for shipment. Most of the material was handled within a few hours after its removal from the treating cylinders while it was still warm and with creosote dripping from it.

There were times, particularly during the hot weather, when the "pickled" tie men remained saturated with creosote all day but I do not know of a single case where any bad effects resulted. Some of our men have been doing this same sort of work for years. We used colored labor exclusively, but our white foremen, tie checkers, etc., are more or less in contact with the creosote every day without any bad results. I do not say that creosote will not burn the skin of the face or that a splash in the eye will not cause temporary discomfort, but my experience has been that there is nothing to the "so-called" creosote poisoning theory.

L. H. HARPER,

Superintendent Creosoting Plant, Central of Georgia, Crump's Park, Ga.

## Drinking Treated Water

*Does the treating of boiler water render it unfit to drink?*

Any answer to this question must necessarily depend so much upon the circumstances under which water is treated as well as the original character of the water, the kind of chemicals used and such features as the design of the plant, that no iron clad rule may be stated to govern this matter. However, it may be said in general that, except in those cases where one cannot drink the water because of its taste, chemical treatment does not render unfit for drinking that water which was not unfit before treatment and will often improve it.

This question usually arises where track men see large quantities of chemicals mixed with water that was considered fit for drinking in the untreated state. These chemicals are usually lime soda ash and sulphate of iron. From his experience in handling these materials, the track man knows the chemicals to have properties which burn the hands and rot the sacks containing them. Finding the materials so injurious in the bulk form or inclined to discolor the water when mixed with it, it is not strange that he concludes that the water in which these chemicals are mixed is not fit for drinking. Generally speaking, however, these chemicals not only do not remain in the water themselves but remove from the original water much if not all of the suspended matter that was contained in it as well as more or less injurious matter in solution.

In view of this, it may be said that if the plant is operated in a cleanly fashion with no one permitted to interfere with the natural process of treating and with the settled matter removed from the tank frequently, a railroad employee usually has no need to worry about experiencing any ill effects of drinking any treated water that has not too strong a taste. It seldom happens that the water is rendered less fit for drinking or less wholesome by the treating process. In every case where a doubt arises, the matter should be brought to the attention of the engineer of water service.

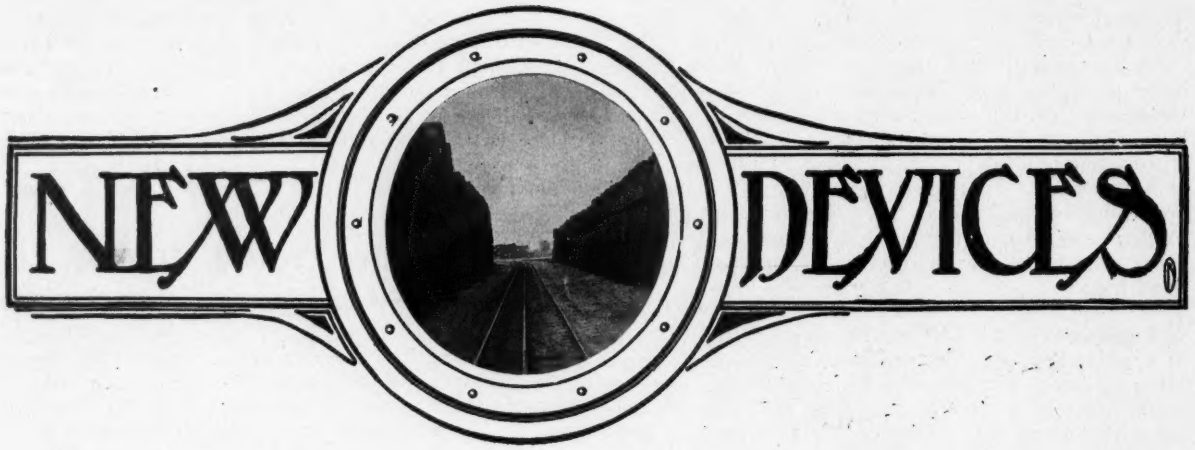
## Answers to Old Questions

### Bracing a Creosoted Pile Bent

In cases where the bracing is not more than 2 in. from the pile, the brace and pile should first be bored and a bolt applied with the thread end of the bolt next to the brace. The brace should then be forced against the pile with a jack and chain. When the space between the brace and the pile is 2 in. or more, a filler block should be placed between the pile and the brace, using good sound timber for such blocking. Generally a piece of the timber of the same kind from which the bracing is made should be used. By cutting this in lengths of about 18 in. and nailing the block through each corner into the brace with nails of proper length, the block will be held in place and prevented from splitting. This method will also prevent the falling off of the brace bolt.

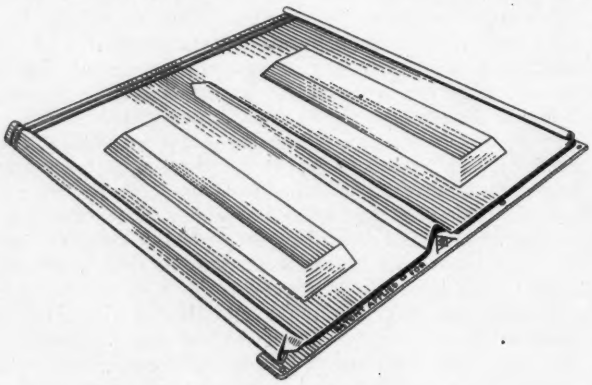
A. S. CLOPTON,

Supervisor of Bridges and Buildings, M. K. & T., Oklahoma City, Okla.




## Aluminum for Roofing

THE FAVORABLE reputation which aluminum has established for itself in recent years in a variety of uses where lightness in weight and durability as well as appearance are requisite, together with the greatly reduced cost of its production resulting from the substitution of electrolytic methods of extraction for purely chemical methods, have the interesting effect recently of inducing the establishment of an industry devoted solely to the manufacture of this material in forms for roofing purposes.



**One of the Shingles**

One of the principal products of this growing industry is known as the Ridgedown shingle. This shingle consists essentially of a 12-in. by 14-in. sheet of aluminum embossed for purposes of appearance and provided with folds and ridges along the edges to facilitate its attachment to the roof and to adjacent shingles. Contrary to the usual practice the Ridgedown shingles are applied from the ridge downward, the operation consisting essentially of shoving the uppermost shingles under the ridge piece and driving nails through the aprons provided on the lower edge, the next shingles below these then being thrust upward below the surface of the upper shingles and over the nail holes to protect the nails and close the joints.

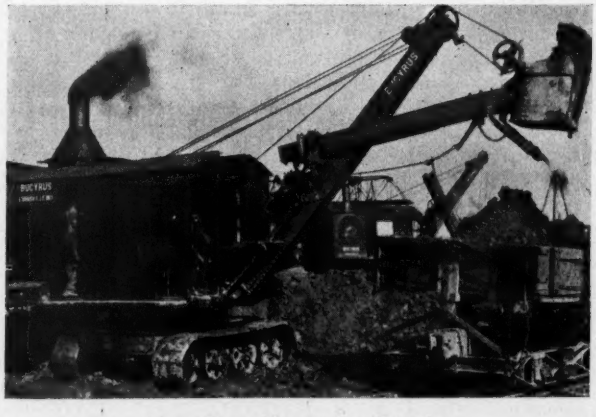
One of the principal features of this shingle is the side-locking device by means of which the shingles are interlocked effectively against dislodgments or leakage, and by reason of which also the objections to aluminum as a roofing material by reason of its excessive expansion and contraction and difficulty of soldering are overcome.

Manufactured of 24 gage, 99 per cent pure aluminum and applied as described above, shingles are said to afford a roof which weighs only 40 lb. per 100 sq. ft., and which will resist indefinitely the effects of weather and gases to which roofing materials are subjected, particularly in the vicinity of railroads. The shingles are applied easily and are also said to be of advantage where trouble is experienced from the warping of roof boards or the forming of pockets having a tendency to hold water and snow. In support of this shingle are also mentioned the facts that the roofing may be removed readily and applied upon a new building and that the scrap value of the material is also large.

The shingle is the product of the American Aluminum Architecture Company, Aurora, Ill.

## A New Design of Revolving Shovel

THE BUCYRUS Company, South Milwaukee, Wis., is now introducing a 20-ton, ¾-yd. revolving shovel known as its 20-B, which replaces its 14-B revolving shovel. From boom point to ash pan this shovel is of new design and it has been under test and in service on construction jobs for four months. In general it follows along the lines of the Bucyrus 30-B universal shovel, being adaptable to drag line, high line, clam shell, crane and other combinations.



**The New Shovel at Work**

Among the innovations is a two-part instead of a three-part hoist which is of special value when the shovel is used as a drag line excavator. This change also results in reduced wear on the rope, a shorter amount of which is required and makes possible a faster digging speed without sacrifice of power.

This shovel is provided with the outside type of dipper sticks and box girder type of boom, which has proved through extensive experience on the large eight-yard stripping shovels to possess unusual strength in withstanding the twisting and wrenching strains of shovel work.

The A-frame is directly connected to a steel center casting to which the back leg is also connected. All four corners of the dipper are rounded, which feature is claimed to increase its ability to free itself from sticky materials. The shovel is equipped with a three-lever control and is designed for two speeds, change from one to the other being made with one lever similar to an automobile shift.

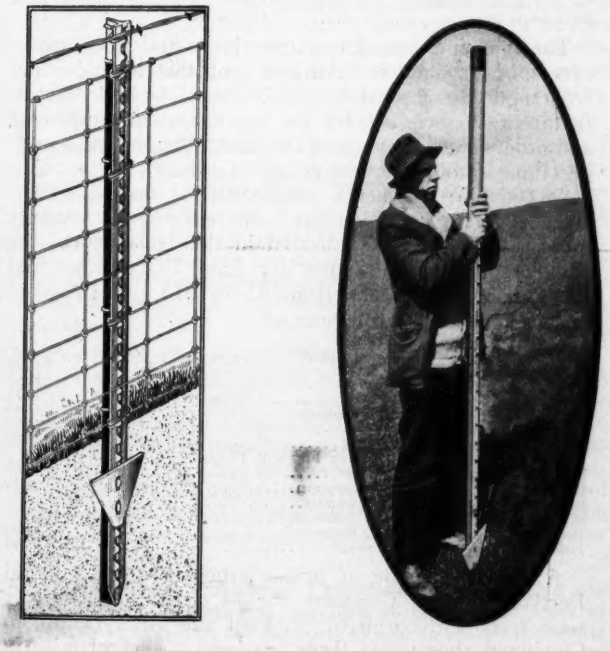
The boiler has a larger heating surface and grate area than is commonly found on shovels of this size. It is also equipped with a patented scale chamber which is claimed to make it possible to work more satisfactorily with poorer water.

The shovel is equipped with a device for lowering the stack by power. Special attention has been given in the design to accessibility for repair, as a result of which the vertical propelling shaft may be lifted out from the top, while the swing rollers are arranged so that they can be removed without the necessity of jacking up the frame.

The shovel may be mounted on caterpillars, trucks or traction wheels. Special attention has been given to the design of the caterpillars and a number of new features have been introduced. New features have also been incorporated in the type of steering wheels provided.

## A Modified Design of Red Top Steel Fence Post

THE CHICAGO Steel Post Company, Chicago, is introducing a modification of its Red Top steel fence post for which a number of advantages are claimed.

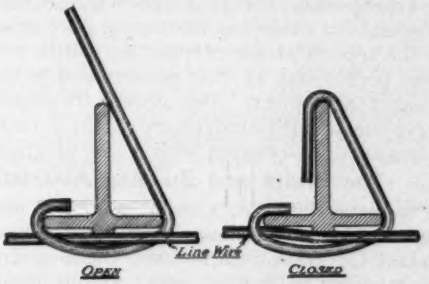


The New Post and Manner of Driving It

Prior to this year this post has been made in both tee and angle sections with slots punched in one leg through which the fence wire is attached by staples. The post is pointed at the end and is held in place by an anchor plate attached rigidly to it below the ground line. It is rolled of rail steel. This post is driven with a sledge without any excavation.

The principal modification which has been made in the new design has been to substitute for the slots a row of lugs in the back of the post opposite the leg of the tee, the new post being rolled only in the tee section.

By the elimination of the slots the weakening of the section is avoided, while on the other hand the studs add to its strength. Tests show the new post to be 25 per cent stronger than a punched tee post. This modification in design of the post requires a change in the manner of attaching the fence to it. Instead of the staple a new fastener has been devised in the form of No. 10 gage wire which is bent to fit over one leg of the post. In application it is laid over one line wire of the fence and




The New Fastener

then the free end is bent over the leg of the post with an ordinary hammer. As the lugs are spaced 2 in. center to center, the sagging of the fence is prevented. Tests have shown this type of fastening to be twice as strong as a 1½-in. staple clinched through a punched steel post.

Coincident with the development of the new post, a driver has been perfected to replace the sledge. Briefly, it consists of a circular tube of a diameter sufficiently large to drop over the post, open at the lower end and closed at the upper end with a mass of heavy metal of sufficient weight to force the post into the ground, pile driver fashion, by raising it and allowing it to fall. With this device, which weighs 25 lb., it is possible for one man to drive as many as 30 posts per hour in a right-of-way fence and without the need of a helper to hold the posts for him.

A Rock Cut on the Alaskan Railway


### The Roadmasters' Association

The executive committees of the Roadmasters' Association and the Track Supply Association and the chairmen of the committees of the former organization will meet at the Hotel Statler, Cleveland, on July 8, to complete arrangements for the convention of the former association and the exhibit of the supply association. At that time the reports of the committees will be reviewed and revised preliminary to their presentation before the convention in September. The officers are making plans to observe the fortieth anniversary of the formation of the Roadmasters' Association with a special program.

### The Bridge and Building Association

It is planned to call a meeting of the Board of Direction in Cincinnati about the middle of July to go over the plans for the convention with the local arrangements committee and to transact other routine business of the society. It is expected that reports will then be in hand in practically complete form from all of the committees and that they will also be reviewed. Three reports are now in the hands of the president and the remainder are promised within the next two weeks, the work in this direction being considerably in advance of that of preceding years.

The membership committee is continuing its campaign for new members and is now bringing the claims of the association to the attention of a carefully selected list of 200 eligible railway officers responsible for the construction and maintenance of bridges, buildings and water stations.

### Maintenance of Way Club of Chicago

The sixth meeting of the Maintenance of Way Club of Chicago was held at the Auditorium Hotel at 7:30 p. m. on June 21, following a get-together dinner. About 30 attended. The subject for the evening was a talk by C. W. Gennet, Jr., manager of the rail inspection department, Robert W. Hunt & Co., Chicago, who described the various types of rail failures and explained how they could be distinguished, supplementing his talk with a large number of specimens which he exhibited. The next meeting of the club, which will be the first meeting for the new year, will be held on Wednesday, September 6, at which time officers will be elected.

### International Track Supervisors' Club

The first annual meeting and election of officers of the International Track Supervisors' Club was held at the Hotel Statler, Buffalo, N. Y., on Saturday, June 17. The officers elected for the ensuing year were: President, W. F. Nichols, supervisor of track, Lehigh Valley, Buffalo, N. Y.; vice-president, L. S. Weaver, supervisor of track, Erie, Buffalo, N. Y.; secretary-treasurer, A. M. Clough, supervisor of track, New York Central, Batavia, N. Y.

The paper for the evening was presented by J. H. Lynch on the subject of "Making Section Foremen." The subjects to be discussed at the next meeting include the laying of rail with mechanical appliances and the cleaning of stone ballast. M. J. Cooney, retiring president of the club, was warmly commended for his services during the past year.

# The Material Market

WHILE PRICES of iron and steel products used by the railroads have not advanced appreciably during the past month, a review of the fundamental facts relating to the iron and steel industry indicates that there is little hope of anything but further advances in prices. The business of the industry is growing rapidly. According to statistics compiled from 30 leading companies producing more than 87 per cent of the total tonnage in 1921, the production of steel ingots for the first five months of 1922 was nearly 11,000,000 tons or at the rate of 26,000,000 tons for the year. This should be compared with less than 17,000,000 tons for all of 1921 and 34,000,000 tons for 1920. The plants of the United States Steel Corporation are now working at 75 per cent of capacity and many of the independent producers are operating on much the same scale.

| | Prices in Cents Per Pound | | | |
|---|---|---|---|---|
| | May 20 | | June 20 | |
| | Pittsburgh | Chicago | Pittsburgh | Chicago |
| Track spikes | $2.15 to $2.25 | $2.40 to $2.63 | .... | $2.25 | $2.50 to $2.63 |
| Track bolts | 3.00 | 3.40 to 3.63 | .... | 3.00 | 3.50 to 3.63 |
| Angle bars | 2.40 | .... | 2.40 | .... | 2.40 | .... | 2.40 |
| Tie plates, steel | 1.75 | .... | 1.85 | $1.75 to | 2.00 | .... | 1.85 |
| Tie plates, iron | .... | .... | 1.85 | .... | .... | .... | 1.85 |
| Plain wire | 2.25 | .... | 2.63 | .... | 2.25 | .... | 2.63 |
| Wire nails | 2.40 to 2.50 | 2.78 to 2.88 | 2.40 to 2.50 | 2.78 to 2.88 |
| Barbed wire, gal. | 3.05 to 3.15 | 3.43 to 3.53 | 3.05 to 3.15 | 3.43 to 3.53 |
| C. I. pipe, 6 in. or larger, per ton | .... | .... | 44.60 | .... | .... | .... | 46.60 |
| Plates | 1.50 to 1.75 | 1.65 to 1.80 | 1.60 to 1.80 | 1.75 to 1.85 |
| Shapes | 1.50 to 1.75 | 1.65 to 1.75 | 1.60 to 1.80 | 1.75 to 1.85 |
| Bars | 1.50 to 1.75 | 1.65 to 1.75 | 1.60 to 1.75 | 1.75 to 1.85 |

About the only doubt cast on the present business aspect is manifested by a decreased activity in the scrap market. As shown in the table below, there have been some moderate reductions from last month's prices. However, the quotations are still above those for April.

| | Prices Per Gross Ton at Chicago | |
|---|---|---|
| | May | June |
| Relaying rails | $22.50 to $27.50 | $22.50 to $27.50 |
| Rerolling rails | 15.75 to 16.25 | 15.00 to 15.50 |
| Rails less than 3 ft. long | 15.75 to 16.25 | 15.75 to 16.25 |
| Frogs and switches cut apart | 15.00 to 15.00 | 14.50 to 15.00 |
| | Per Net Ton | |
| No. 1 railroad wrought | 13.50 to 14.00 | 12.50 to 13.00 |
| Steel angle bars | 14.00 to 14.50 | 13.50 to 14.00 |

The lumber business continues large and sales are in excess of production. An index of this is to be had from figures compiled by the National Lumber Manufacturers' Association for the aggregate cut, shipments and orders since the first of the year. For the week ending June 10 these were as follows (in board feet): Cut, 4,498,000,000; shipments, 4,607,000,000; orders, 5,035,000,000. This condition has been reflected by a steady increase in prices as indicated in the table below. A comparison with the figures for June, 1921, shows that the current prices are from $5 to $13 per thousand higher than they were a year ago.

| Southern Mill Prices | May | June |
|---|---|---|
| Flooring, 1x4, B. and B. flat | $41.60 | $46.75 |
| Boards, 1x8, 14 and 16, No. 1 | .... | 31.95 |
| Dimension, 2x4, 16, No. 1 | 23.70 | 25.75 |
| Dimension, 2x10, 16, No. 1, common | 23.20 | 25.40 |
| Timbers, 4x4 to 8x8, No. 1 | 21.05 | 24.00 |
| Timbers, 3x12 to 12x12, No. 1 | 27.55 | 29.00 |
| **Douglas Fir Mill Prices** | | |
| Flooring, 1x4, No. 2, clear, flat | 32.00 | 37.00 |
| Boards, 1x6, 6 to 20, No. 1, common | 12.00 | 12.50 |
| Dimension, 2x4, 16, No. 1, common | 13.50 | 16.50 |
| Dimension, 2x10, 16, No. 1, common | 14.50 | 16.50 |
| Timbers, 6x6 to 8x8, No. 1, common | 18.00 | 17.00 |
| Timbers, 10x10 to 12x12, rough | 17.00 | 18.00 |

A recent schedule of prices issued by the Universal Portland Cement Company for 14 cities in the middle west from Pittsburgh to St. Paul and from Duluth to Cincinnati shows that there has been a general raise in prices of from 10 to 20 cents per barrel. Current prices for cement in carload lots not including package are given below:

| | | | |
|---|---|---|---|
| Pittsburgh | $2.12 | Milwaukee | $2.26 |
| Detroit | 2.37 | Minneapolis | 2.34 |
| Chicago | 2.07 | Davenport | 2.24 |
| Duluth | 2.04 | Cincinnati | 2.45 |

# General News

**In a trial** before a Georgia court, a former flagman of the Atlanta, Birmingham & Atlantic and one of the employees who went out on strike in March, 1921, was convicted of bridge burning and sentenced to life imprisonment under a law in effect in that state authorizing capital punishment for such offenses.

**The Twentieth Century Limited** train of the New York Central completed its 20th year of service on June 15, in recognition of which the platform at the Grand Central Terminal, New York, leading from the concourse to the train, was covered with a red carpet, and the passage decorated with trees and flowers.

**During 1921 the Pennsylvania** realized $6,449,000 from the salvaging of scrap materials, including waste paper and other refuse in offices, it being the practice of this road to collect and salvage the contents of all waste baskets in offices as well as scrap materials on the line. Over $60,000 was realized from the sale of scrap paper alone during 1921.

**Reports of railway earnings** for April show the net operating income of all Class 1 roads to approximate $50,000,000, which, on an annual basis, represents a return of 3.93 per cent on the tentative valuation. This income is to be compared with a net operating income of approximately $30,000,000 for April of last year, representing an annual return of 2.33 per cent.

**The American Railway Association's** report on the coal situation shows that railroads in the United States had 10,847,000 tons of bituminous coal in stock piles or in cars on June 1, which, when based upon the average daily consumption for the month of May of about 284,000 tons, of which 140,000 tons a day were taken from stock piles, represents a 75 days' supply.

**The Railroad Y. M. C. A.** celebrated its fiftieth anniversary on June 11, 1922, by holding ceremonials at all points where the association is established. The first reading room was opened in the Cleveland, Ohio, railroad station, since which the association has developed to a point where it now operates 269 buildings and has a total membership in excess of 125,000. A ceremonial held at the Hotel Commodore in New York was presided over by President Truesdale of the Lackawanna.

**The Baldwin Locomotive Works,** which has recently completed 50 oil burning freight locomotives for the Southern Pacific, shipped 20 of them in a special train May 26 to the Southern Pacific at Corsicana, Texas. The train, exclusive of the locomotives propelling it, weighed over 6,000 tons and was nearly a mile long, each locomotive with tender measuring about 100 ft. The train traveled only in day time and was exhibited at cities along the route, advance information having been issued to apply to the arrival of the train at different points.

**The Interstate Commerce Commission,** after hearing objections made by railroads, included in its tentative order of January 10, directing 49 railroads named to install automatic train stop or train control devices upon designated portions of their roads, has adopted the order with the provision that all installations prescribed should be completed by January 1, 1925. The order further provides that the train control device shall be operated in connection with all road engines running on or over at least one full-passenger-locomotive division between the points designated, and requires all roads coming under the order to submit complete and detailed plans and specifications prior to the installation of the devices for the inspection and approval by the commission.

**The Chicago, Rock Island & Pacific** is preparing to celebrate its 70th anniversary on October 10. Prominent features of the plan will be the delivery by radio of an address of President Gorman to employees' clubs over the system, the issuing of a special historical booklet for general distribution, the planting of anniversary trees on company property and around station grounds, the establishment of a historical exhibit in the La Salle Street station, Chicago, and the decoration of all passenger engines over the system, as well as the inauguration of a cleaning up period directed to the end of improving the appearance of all buildings and grounds.

**A condensing turbine** type of locomotive was recently placed in service on the Swedish State Railway, which marks a radical departure in locomotive construction and is reported to show remarkable records in fuel economy. Unlike the ordinary steam locomotive, there is no driving machinery under the boiler, the drivers being located rather under the tender unit, which also contains the condenser. Instead of the exhaust steam being discharged into the open air, it is returned to a hot well, from which it is pumped into the boiler as feed water. The locomotive is being used in passenger service out of Stockholm and is reported to show a reduction of 52 per cent in the consumption of fuel as compared with the reciprocating superheated Pacific type locomotive which is used on the same run.

**In a recent decision** affecting railway freight rates the Interstate Commerce Commission held that a net income of 5¾ per cent on the aggregate value of railway properties is now a fair return, as distinguished from 6 per cent fixed by the Transportation Act for the two years ending March 1, 1922, and ordered a general reduction of 10 per cent in all freight rates except such as were reduced by the Commission's decisions in grain, live stock and southern hardwood lumber cases and excepting also for such rates as were lowered by the voluntary 10 per cent reduction on agricultural products made by the carriers. It is estimated that this reduction represents a decrease in freight revenues about $225,000,000 a year and when added to the voluntary reductions and those made in other excepted cases, represents a reduction of approximately $400,000,000.

**A movement was begun in** New York City recently by the American Engineering Standards Committee to standardize colors for traffic signals, under a plan, which includes considerations of signalling in railway and steamship operations. The avowed purpose in this movement is that of establishing codes of signaling so different one from the other that no confusion will arise in identifying one system from the other. In presenting unofficially the case of the railroads, A. H. Rudd, chief signal engineer of the Pennsylvania, contended that the committee should adopt red as a stop signal in all cases unless qualified by a more favorable indication, should adopt the use of yellow for tail lights of automobiles or for any other purposes where caution only is required, and should adopt the use of green lights for fire escapes, for proceed signals at street intersections or to indicate a clear way.

**Correction.**—Through a typographical error the weight of the new lightweight motor inspection car handled by Craft Incorporated, New York City, and described on page 182 of the May issue was misstated. The correct weight for this car is about 250 lb.

# Personal Mention

## General

**John C. Sesser,** engineer maintenance of way and structures of the Wheeling & Lake Erie with headquarters at Brewster, Ohio, has resigned to become assistant vice-president of the Cuba railroad with headquarters at Camaguey, Cuba.

**A. E. Wallace,** who left the Erie on June 1, as manager of the Chicago region with headquarters at Chicago, to become general manager of the Minneapolis, St. Paul & Sault Ste. Marie, with headquarters at Minneapolis, Minn., upon G. R. Huntington's election to president, has several years of service in the maintenance of way department included in his record of railway experience. Mr. Wallace was born at Nashua, N. H., on March 2, 1879, and was educated at Harvard University, from which he was graduated with the degree of bachelor in arts in 1902. He entered railway service in November of the same year as a clerk on the Great Northern at Larimore, N. D., and engaged in maintenance of way work to January, 1907, when he resigned a clerical position on the Rock Island to become assistant extra gang foreman in the service of the Chicago, Burlington & Quincy, from which he was successively advanced to foreman, and assistant roadmaster, until his appointment as trainmaster in February, 1911.

A. E. Wallace

**Robert S. Parsons,** general manager of the Erie with headquarters at New York, and an engineer by education and early training, was elected vice-president in charge of operation with the same headquarters, effective June 1. Mr. Parsons was born at Hohokus, N. J., and attended Rutgers College. He began railroad work in 1895 as a rodman for the Erie and the following year was promoted to assistant engineer. In 1899 he was appointed division engineer of the New York, Susquehanna & Western, and returned to the Erie in 1913 as engineer maintenance of way, a position from which he was advanced three years later to assistant general superintendent. He was appointed superintendent of the Susquehanna division in 1907 and three years later was transferred to the New York division. On January 1, 1913, he was appointed assistant general manager of the lines east of Buffalo and Salamanca with headquarters at New York; was appointed general manager of the Ohio grand division (the Erie's western lines) with headquarters at Cleveland, Ohio, in 1914, and in January, 1916, was appointed chief engineer. During the following year he served as assistant to the president and chief engineer and in November, 1917, was appointed assistant to the president and general manager, an office he filled until the period of federal control when he was again appointed chief engineer. He became general manager in 1920 at the close of federal control.

Robert S. Parsons

**W. R. Kettering,** office engineer of the Chicago & North Western at Chicago, has been promoted to auditor of capital expenditures, with the same headquarters, effective June 1, to succeed A. F. Morris, whose death was reported in the June issue. Mr. Kettering was born in DeWitt, Iowa, in 1880, and was graduated from Cornell College, Iowa, in 1902, after which he entered railway service as an instrumentman in the track elevation department of the Chicago & North Western. He was promoted to division engineer on construction in 1907 and from 1908 to 1911 served as division engineer on the construction of the passenger terminal in Chicago. Thereafter he served in the maintenance department at Boone, Iowa, and later in various capacities in the valuation department until the period of federal control in 1918, when he was assistant in the office of the corporate engineer for a year. Following the termination of federal control in 1920 he was appointed office engineer, which position he held until the time of his recent promotion.

## Engineering

**Major L. D. Blauvelt,** former chief engineer of the Denver & Salt Lake, has resigned as state highway engineer of Colorado to become chief construction engineer for the commission established to construct a tunnel through the Continental Divide on the line of the Denver & Salt Lake, west of Denver, Colo.

**R. A. Feldes,** assistant chief engineer of the Indiana Harbor Belt, with headquarters at Gibson, Ind., has been promoted to chief engineer to succeed **O. H. Gersbach,** appointed chief engineer of the Chicago River & Indiana and the Chicago Junction, recently acquired by purchase and lease, respectively, by the New York Central, of which the Indiana Harbor Belt is a subsidiary.

**G. W. Hegel,** chief engineer of the Chicago Junction, with headquarters at Chicago, has resigned to take charge of the construction of a Union stock yard and manufacturing district in Los Angeles, Cal., which will involve an initial construction of approximately 20 miles of standard gage track with necessary terminal facilities, access to which is to be obtained over Union Pacific tracks.

**J. F. Bannet** has been promoted to assistant engineer in the district engineer's office of the Missouri Pacific at St. Louis, Mo., to succeed **H. A. Israel,** who has been promoted to division engineer of the Kansas City Terminal division with headquarters at Kansas City, Mo., to succeed **P. Galvin,** appointed roadmaster of the Northern Kansas division with headquarters at Downs, Kan., in place of **R. B. Thayer.**

**A. N. Huntsman,** assistant engineer on the Wabash, with headquarters at Montpelier, Ohio, has been promoted to division engineer of the St. Louis terminals with headquarters at St. Louis, Mo., effective June 10, to succeed **J. A. Vitt,** who has been transferred to the Springfield division with headquarters at Springfield, Ill., to succeed **Edward Shelah,** promoted to the newly created position of inspector of maintenance.

## Track

**F. A. Taylor,** has been promoted to track supervisor on the Southern, Lines West, with headquarters at Lincoln City, Ind., to succeed **W. B. Skinner,** transferred, and effective June 17. **Grover Kidd** has been promoted to track supervisor, with headquarters at Oakdale, Tenn., to succeed J. W. King, resigned.

**F. S. Purdy,** acting inspector of track and roadway of the Atchison, Topeka & Santa Fe, Coast Lines, to assist J. E. McNeal since the latter's injury in a motor car accident last November, has been promoted to inspector of track and roadway to succeed Mr. McNeil, whos death is noted in another column.

**E. E. Earl,** acting roadmaster of the Klamath district of the Southern Pacific with headquarters at Klamath Falls, Ore., has been promoted to roadmaster with the same headquarters effective June 10, to succeed C. L. Crow, resigned. Effective June 12, **W. A. Caxton** has been appointed acting assistant roadmaster of the Siskiyou district, with headquarters at Hornbrook, Cal., to relieve Thomas Connor, on sick leave.

**Lon Holland,** has been appointed acting roadmaster on the Southern Kansas division of the Atchison, Topeka & Santa Fe, with headquarters at Independence, Kansas, effective June 3, to succeed G. W. Smith, on sick leave. Mr. Holland will have jurisdiction over the first district and from Chanute to Independence on the Coffeyville district as well as jurisdiction over the third district from Independence to Moline and the Fredonia district.

**P. Galvin,** division engineer of the Kansas City Terminal division of the Missouri Pacific with headquarters at Kansas City, Mo., has been appointed roadmaster of the Northern Kansas division with headquarters at Downs, Kan., to succeed R. B. Thayer. Effective June 1, **C. Cherry,** roadmaster of the Omaha division, with headquarters at Auburn, Neb., has been transferred to the Central Kansas division with headquarters at Marquette, Kan., to succeed **E. G. Masters,** transferred to the Omaha division at Auburn.

**R. D. Pierson,** assistant division engineer on the Arizona division of the Atchison, Topeka & Santa Fe, with headquarters at Needles, Cal., has been promoted to acting roadmaster on the Arizona division with the same headquarters, to succeed **F. C. Blodgett,** who has been promoted to general roadmaster of the first district of the Arizona division in charge of the distribution of track and building materials and with supervision over the construction of the double track between Yampai and Griffith. **H. L. Hoskins** has been appointed acting roadmaster of the third district, Arizona division, with headquarters at Parker, Arizona, to succeed T. G. McNeill, granted leave of absence, and Noah Bridges, has been appointed acting roadmaster of the first district, Middle division, with headquarters at Newton, Kansas, to succeed **W. F. Muff,** granted leave of absence.

**T. P. O'Neill,** assistant engineer on the Chicago, Burlington & Quincy, has been appointed roadmaster on the Kansas, Oklahoma & Gulf, with headquarters at Allen, Okla., in place of R. W. Gooch. Mr. O'Neill was born on April 20, 1883, at St. Catherine, Mo., and entered railway service in 1900 as a track laborer on the Chicago, Burlington & Quincy where he remained until 1910, working up to the position of instrumentman. He resigned in 1910 to become instrumentman with the Kansas City Terminal Company, with which he served until 1913, when he became engaged in valuation work on the Kansas City Southern. Later he became ballast inspector on the Missouri, Oklahoma & Gulf. He re-entered valuation work in 1915 on the Texas & Pacific and in the following year became assistant engineer on the Chicago, Burlington & Quincy, where he remained for three years, since which he was acting assistant engineer until his recent appointment on the Kansas, Oklahoma & Gulf.

**Colvin S. McConnell,** whose promotion to roadmaster on the Chicago & North Western, with headquarters at Antigo, Wis., was reported in the May issue, was born on October 20, 1890, at Oak Park, Ill. He commenced work as a rodman for the Schott Engineering Company at Great Lakes, Ill., in July, 1908. In November of the same year he entered the employ of the Latrobe Steel & Coupler Company at Melrose Park, Ill., as an engineer's helper and a tracer, where he remained until April, 1909, when he again became a rodman in the employ of the Schott Engineering Company. In November of that year he renewed his connection with Latrobe Steel & Coupler Company and was employed as a tracer until March, 1910, when he entered railway service as a tapeman on the Chicago & North Western, a position he held until September of that year when he entered the University of Wisconsin. In July, 1912, he again became rodman on the Chicago & North Western, since which time he served as rodman, instrumentman and assistant engineer to May, 1914, and thereafter as rodman on location and construction and consecutively as instrumentman and assistant engineer on maintenance until his recent promotion to roadmaster.

## Bridge and Building

**Harry A. Cameron,** whose appointment as chief carpenter on the Chicago, Milwaukee & St. Paul, with headquarters at Terre Haute, Ind., was announced in the June issue, was born on June 10, 1874 at Dubuque, Iowa, and entered railway service on July 20, 1889 as a clerk on the Chicago Milwaukee & St. Paul. Thereafter, he was employed consecutively as clerk, carpenter, pump repairer, pile driver, engineer and foreman on the Dubuque division until July 15, 1905, when he was appointed relief chief carpenter of the Superior division. He served in this capacity on the Superior-Northern and Wisconsin Valley divisions until October, 1905, when he was placed in charge of track and bridge material on the extensions of lines west of the Missouri river, a position he held until January, 1907, when he was promoted to chief carpenter of the Dubuque division. He was transferred to general foreman of the Sioux City terminals on May 1, 1917 and continued in this capacity until July 10, 1918, when he resumed the office of chief carpenter of the Dubuque division. Thereafter, he continued as chief carpenter until July 17, 1918; served as chief clerk to the superintendent of the Dubuque division from July 17, 1918 to December 1, 1919, was employed again as chief carpenter of the Dubuque division from December 1, 1919, to April 6, 1920, and again as chief clerk to the superintendent from April 6, 1920, to April 15, 1922, when he was appointed chief carpenter of the Terre Haute division.

## Obituary

**James Franklin Ingram,** retired bridge engineer of the Louisville & Nashville and an employee of that company for 57 years, died in Louisville, Ky., on May 9, at the age of 87 years.

**William C. Edes,** ex-chairman and former chief engineer of the Alaska Engineering Commission, died on a train near Merced, Cal., May 25, at the age of 65 years. Mr. Edes was born at Bolton, Mass., on Jan. 14, 1856, and was educated at the Massachusetts Institute of Technology, from which he was graduated in civil engineering in 1875. He entered railway service three years later as a member of a railway location party on the Southern Pacific and continued in the employ of this company in various engineering capacities in Arizona, New Mexico and Texas until 1882, when he entered in private practice in Massachusetts. He re-entered railway service in 1886 as assistant engineer on location and construction for the Southern Pacific and continued in that work for 10 years, during which time he had charge of the construction of a portion of the Oregon & California. He became chief assistant engineer of the San Francisco & San Joaquin Valley in 1896, and in 1901 re-entered the service of the Southern Pacific as assistant engineer, where he was engaged in locating new lines and supervising the reconstruction of other lines, including the Central Pacific from Rocklin, Cal., to Truckee, until 1905, when he became district engineer maintenance of way, with headquarters at San Francisco. A year later he was appointed chief engineer of the Northwestern Pacific. In May, 1914, he was appointed chairman and chief engineer of the Alaskan Engineering Commission. In 1919, he assumed the title of consulting engineer, a position he relinquished in March, 1920, to engage in private consulting work.

William C. Edes

**J. E. McNeil,** inspector of track and roadway on the Atchison, Topeka & Santa Fe, Coast Lines, for 16 years died suddenly on May 28. Mr. McNeil was born on March 16, 1847, at Hamilton, Ont., and entered railway service in 1868 as a brakeman on the Illinois Central, where he served consecutively as brakeman, conductor and trainmaster until 1884, resigning at that time to become trainmaster of the Texas & Pacific. A year later he returned to the Illinois Central and was employed as trainmaster, first at Waterloo, Iowa, and later at Fort Dodge, until 1887; when ill health induced him to remove to California, where in December, 1887, he entered the service of the California Southern, as extra gang foreman and work train conductor and continued from September, 1888, until October, as acting superintendent of construction and thereafter as conductor until 1888, when he became roadmaster on what is now known as the Los Angeles division of the Santa Fe, a position which he relinquished in December, 1906, to become inspector of track and roadway.

J. E. McNeil

**Archibald Stuart Baldwin,** vice-president of the Illinois Central in charge of the Chicago Terminal Improvements and this company's extensive program of electrification in that city, died suddenly on the evening of June 26 on the Michigan Central while on his way from New York to Chicago after an extended visit in Europe, where he attended the International Railway Congress at Rome, Italy, and also made an extended study of European electrification systems. Mr. Baldwin was born at Winchester, Va., on September 28, 1861, and entered railway service in 1879 as a rodman on the Richmond & Allegheny, now a part of the Chesapeake & Ohio, a position which he left in 1880 to become assistant engineer of the Iron and Steel Works Association of Virginia. He was employed as assistant engineer and engineer of this company until 1882, when he re-entered railway service as a draftsman on the Philadelphia extension of the Baltimore & Ohio. Advanced a short time later to assistant engineer, he continued in this capacity until 1885, when he became principal assistant engineer on the construction of the Missouri river bridge of the Chicago, Milwaukee & St. Paul at Kansas City, Mo., a position he occupied until 1886. Consecutively thereafter, he was resident engineer on the Louisville, St. Louis & Texas from 1886 to 1887, assistant engineer on the Louisville & Nashville from 1887 to 1889 and roadmaster until December, 1901, when he entered the service of the Illinois Central as principal assistant engineer. He was advanced to engineer of construction on May 1, 1903, was promoted to chief engineer on March 20, 1905, and on August 1, 1918, was elected vice-president of the corporation, a position he held until March 1, 1920, when he was appointed vice-president in charge of the Chicago Terminal Improvements.

A. S. Baldwin

# Construction News

**The American Railway Express** called for bids during the month for the construction of a brick building at Waukegan, Ill., to cost approximately $12,000.

**The Atchison, Topeka & Santa Fe,** which was reported in the June issue, as receiving bids for station extensions and alterations at Lubbock, Texas, and Waynoka, Okla., to cost approximately $15,000 each, has awarded contracts for this work to E. F. Ware, El Paso, Texas.

**The Atchison, Topeka & Santa Fe** has authorized the construction of a new boiler and tank shop at Albuquerque, N. M., to cost approximately $400,000; also the construction of boiler washing plants at Amarillo, Texas and Winoka. This company has received bids for station extensions and alterations at Lobbock, Texas, and Waynoka, Okla., to cost approximately $15,000 at each place and has awarded a contract to Jerome Moss, Chicago, for the construction of bunk houses at Ottawa, Kans., Cherryville and Strong City, Kansas, and at Newkirk, Oklahoma, to cost approximately $37,000. This company noted in the April issue as having authorized the construction of a 43-mile cut-off, extending from Eldorado, Kan., to Ellinor, and to include a 4-mile belt line east of Eldorado, has recently closed bids for this work. This company has also authorized the construction of the first unit of enlarged freight terminal facilities at Dallas, Tex., the work in immediate contemplation to involve an expediture of approximately $20,000, and has authorized extensive repairs to the crossings over the San Gabriel river near Los Angeles, Cal. This is to include the construction of a 32 by 704 ft. spillway and the rebuilding of a pier destroyed by a flood.

**The Baltimore & Ohio** has awarded a contract to the Vang Construction Company, Cumberland, Md., for the construction of a girder bridge at Gary, Ind., to cost approximately $50,000.

**The Buffalo, Rochester & Pittsburgh** has awarded a contract to the Ogle Construction Co., Chicago, for the construction of a 1200-ton frame coaling station at Rikers, Pa., to include a duplex hoisting equipment with two-way buckets and complete sanding facilities.

**The Canadian National** closed bids on May 31 for the construction of a cast-iron pipe line three miles long at Kindersley, Sask., and for the construction of a four-mile line revision on the Grand Trunk Pacific between Ansell, Alta., and Bickerdike; also for a four-mile connection between the Bashaw and Battle River subdivisions near Camrose, Alta., and for a two-mile connection between the Viking and Battle River subdivisions at Ryley, Alta.

**The Canadian Pacific** has awarded a contract to the John Hayman & Sons Company, London, Ont., for the construction of a new freight shed and office building at Windsor, Ont. The office portion of the building will be 40 ft. by 60 ft. and the freight shed portion 40 ft. by 304 ft. The building will rest on concrete foundations and a basement will be provided under the office structure. This company, noted in the May issue as about to construct coaling plants at Swift Current, Sask., Medicine Hat, Alta., La Riviere, Man., and Eagle River, Ont., has awarded a contract to the Claydon Company, for the plants at Eagle River, Ont., and La Riviere, Man., and a contract to D. E. Hughes, Calgary, Alta., for the plant at Medicine Hat, Alta., the Swift Current plant to be built by company forces. This company, noted also in the May issue, as calling for bids for the construction of a new bridge over the Coquitlam river, Vancouver, B. C., to replace the structure washed away during the November floods, has ordered the steel from the Canadian Bridge Company and has awarded the contract to W. D. Grant, Vancouver, for the construction of the concrete abutments necessary for the new structure.

**The Central Vermont** has awarded a contract to the Roberts & Schaefer Company, Chicago, for the construction of a 150-ton coaling plant of frame construction at New Lon-

don, Conn., and for "N & W" type electric cinder handling plants at Burlington, Vt., and White River Junction.

**The Chesapeake & Ohio** has awarded contracts to Joseph E. Wilson Sons, Chicago, for the construction of terminal facilities at Peach Creek, W. Va., involving a five-stall engine house addition, a shop and storeroom and a power house, and for the construction of a five-stall brick addition to its roundhouse at Peru, Ind., these projects to cost approximately $350,000 and $125,000, respectively.

**The Chicago & Alton** has obtained authority from the Interstate Commerce Commission to construct an extension from Titus, Ill., south about 3¾ miles, and a branch from a point about two miles south of Titus and extending westerly approximately two miles.

**The Chicago & North Western,** noted in the June issue, as receiving bids for a 100-ton coaling station at Manitowoc, Wis., has awarded a contract for this work to the Roberts & Schaefer Company, Chicago. This company reported in the May issue as contemplating rebuilding its 12-stall engine house at Ashland, Wisconsin, in the near future, has awarded a contract for this work to C. W. Gindle, Chicago.

**The Chicago, Burlington & Quincy** is calling for bids until July 6 for the construction of a new 6-stall engine house at Rock Island, Ill. This company has awarded a contract to A. J. Armbruster & Company, Aurora, Ill., for the construction of a passenger station at Aurora to cost approximately $100,000, and will partially replace this season its bridge over the Platte river near Oreapolis, Neb., with a steel and concrete structure to cost about $400,000, the steel for which has been ordered from the American Bridge Company. The company has awarded a contract to Frank Jacoby, Billings, Mont., for the construction of station extensions at Thermopolis, Wyo., and a contract to G. A. Johnson, Chicago, for the construction of a passenger station at Michell, Neb. This company is calling for bids for a new five stall roundhouse at Council Bluffs, Iowa, a combination freight and passenger station at West Frankfort, Ill., and for the construction of a power house addition at Plattsmouth, Neb.

**The Chicago, Indianapolis & Louisville** is calling for bids for the construction of a passenger station at 38th street, Indianapolis, Ind.

**The Chicago, Rock Island & Pacific** has awarded a contract to Joseph E. Nelson & Sons, Chicago, for the construction of a water softening plant at Council Bluffs, Iowa. This company reported in the March issue as contemplating the construction of a one story brick passenger station at Graham, Texas, estimated to cost $25,000 is now calling for bids on this work. This company has awarded a contract to the Gould Construction Company, Davenport, Iowa, for the construction of an 8-ft. by 9-ft. by 190-ft. reinforced concrete box at Pershing, Iowa, to replace a high trestle at that point, a 6-ft. by 6-ft. by 30-ft. reinforced concrete box near Eldon, Iowa, to replace a stone box at that point, two concrete and steel subways near Fairfield, Iowa, to replace existing structures and a 12-ft. by 12-ft. by 25-ft. reinforced concrete box near Jamesport, Iowa, to replace a stone and steel structure at that point; this work to involve the expenditure of approximately $60,000.

**The Chicago Union Station,** noted in the June issue as calling for bids for the construction of the first section of the headhouse of its station along with other work, has awarded the contract for this work to the R. C. Wieboldt Construction Company, Chicago. This company has awarded the contract to George P. Cullen, Chicago, for the widening of Canal street between Madison and Washington streets, a distance of about 600 ft., and has awarded a contract to Paschen Bros. Co., Chicago, for the superstructure for the Union Station power house. A contract has also been awarded to the Mellon-Stewart Company, Chicago, for the construction of a concrete and steel viaduct over the union station tracks at Madison street.

**The Cincinnati Northern** will accept bids until July 3 for eight bridge spans.

**The Cleveland, Cincinnati, Chicago & St. Louis** has obtained authority from the Interstate Commerce Commission to construct a cut-off from a point on the Cincinnati division in Brown Township, Delaware County, Ohio, 3½ miles, to a connection with its present main line track.

**The Delaware & Hudson** has awarded a contract to the Roberts & Schaefer Company, Chicago, for the construction of a 500-ton, two-pocket, four-track, automatic electric, reinforced concrete locomotive coaling station and sanding plant at South Junction, near Plattsburg, N. Y., this plant to provide overhead coal crushing facilities and to cost approximately $50,000.

**The Delaware, Lackawanna & Western** has undertaken the elimination of a number of grade crossings on its Black Rock branch.

**The Elgin Joliet & Eastern** has awarded a contract to the Roberts & Schaefer Company, Chicago, for the installation of automatic electric hoisting equipment in its East Joliet, Ill., and Waukegan coaling plants.

**The Erie** has awarded a contract to the Bates & Rogers Construction Company, Chicago, for the construction of extensions to its shops at Hornell, N. Y.

**The Gulf Ports Terminal** which was denied authority by the Interstate Commerce Commission, on August 18, 1921, to construct an extension in Baldwin and Mobile counties, Ala., has obtained a ruling permitting it to resume the work. The construction of the proposed extension was begun several years ago and the clearing, grubbing and grading on 18 miles from the track end to the east side of Mobile Bay is completed, and piles for trestles driven.

**The Illinois Central** has awarded a contract to W. J. Zitterall, Webster City, Iowa, for the construction of a brick stationa at Ziegler, Ill.; has closed bids for the laying of water supply pipe lines at Kankakee, Ill., to cost approximately $20,000, and has awarded a contract to Joseph E. Nelson & Sons, Chicago, for the construction work incident to the installation of a mechanical hump and track scale, including a scale house and foreman's house, at Centralia, Ill., the work to cost approximately $30,000. This company, noted in the May issue as accepting bids for the construction of a joint passenger station with the Toledo, Peoria & Western, at Gilman, Ill., has awarded the contract for this work to the Ellington-Miller Company, Chicago, the work to cost approximately $50,000.

**The Illinois Central Terminal** has awarded a contract to the Great Lakes Dredge & Dock Company, Chicago, for, and is now undertaking, the construction of an earth filled bulkhead to extend 435 ft. into Lake Michigan from the present short line opposite Twenty-third street and on the center line of the proposed South Park boulevard viaduct, to the property line acquired by its company from the city of Chicago pursuant to its electrification program, this bulkhead to involve the placing of about 100,000 yards of excavation from the lake bottom and to permit in conjunction with an extension to be made by the city the filling in of all submerged property acquired from the city.

**The Kansas City Southern** is now preparing plans for and expects to undertake in the near future with its own forces, improvements to its shop at Pittsburg, Kan., which will consist principally of 160-ft. and 110-ft. extensions to the present erecting shop, to provide facilities, respectively, for additional erecting space and for a blacksmith shop. The work will also include a 64-ft. extension to the present transfer table. The building will have concrete foundations, brick walls, with wire glass in metal sash and composition roofing on steel roof trusses. Each of the bays in the extensions to the erecting shop will be provided with engine pits to be served by a 10-ton and 250-ton traveling crane. The work will cost approximately $200,000.

**The Michigan Central** has awarded a contract to the Roberts & Schaefer Company, Chicago, for a 500-ton reinforced concrete coaling station and sanding plant at Michigan City, Ind., the structure to supply four tracks, and to cost approximately $48,000.

**The Missouri, Kansas & Texas,** noted in the February issue

as preparing plans for new terminal facilities at Denison, Texas, is now accepting bids for this work. It will include a 22 stall brick roundhouse, a shop, storehouse, power house, car repair shop and incidental buildings, including yard office, oil and tool houses, a track scale and transfer platform.

**The Missouri Pacific** is calling for bids for the construction of an interlocking tower at Kenneth, Kan.

**The Nashville, Chattanooga & St. Louis,** jointly with the Mobile & Ohio, received bids during the month for a brick and stucco passenger station at Union City, Tenn., to cost approximately $20,000.

**The Pacific Fruit Express** received bids during the month for the construction of artificial ice plants at Nampa, Idaho, and Pocatello, each of which will involve the expenditure of approximately $50,000.

**The Pennsylvania** has called for bids for the raising of tracks and change of line near Phoenix, Md. The approximate quantities include about 135,000 cu. yd. excavation, 1,300 cu. yd. of masonry, two miles of track material unloaded, distributed and laid, 20,000 cu. yd. cinder fill removed, 10,000 lin. ft. track removed, 4,600 lin. ft. raised, 5,000 cu. yd. ballast unloaded and surfaced, etc. This company also asked for bids for work necessary to complete the engine terminal facilities at Hagerstown, Md., on the Cumberland Valley division, the approximate amount of materials for which include about 13,500 cu. yd. excavation, 2,000 cu. yd. concrete masonry, 32,000 cu. yd. cinders unloaded, 7,000 cu. yd. cinder ballast, and 2.5 miles track material. Bids were closed June 7. J. W. Craig, assistant engineer, Baltimore, Md., will be in charge of the former, and W. K. Martin, engineer of construction, Harrisburg, Pa., of the latter work.

**The Santa Fe & Los Angeles Harbor** has obtained authority from the Interstate Commerce Commission for a certificate authorizing the construction of a line from a connection with the Atchison, Topeka & Santa Fe near El Segundo, Cal., to Torrance and Wilmington, all in Los Angeles County, Cal., 12.54 miles. The road is to be operated by the Santa Fe, which has also filed an application for authority to acquire the stock of the road and to operate it under a lease.

**The St. Louis-San Francisco** has awarded a contract to the T. S. Leake Construction Company, Chicago, for the construction of a passenger station at Jennings, Okla., to cost approximately $12,000.

**The St. Paul Union Station** has closed bids for approximately $5,000,000 of construction work on the new Union station at St. Paul, Minn., this work to involve the completing of the third and fourth periods of the project, for each of which separate bids were called. The work will include extensions to the waiting rooms, track elevation and street subways.

**The Union Pacific,** noted in the May issue as planning to construct the substructure of a bridge across the Columbia river near Attalia, Wash., this season, has awarded the contract for this work to the Missouri Valley Bridge & Iron Works, Kansas City, Mo. This company is calling for bids for extensions to the eating house at Cheyenne, Wyoming, to exceed $50,000, and for the lining of two tunnels in Wyoming. This company has authorized and will undertake at the earliest possible date the construction of 20.47 miles of second track on the Oregon Short Line through Glenns Ferry, Idaho. The timber treating plant which this company was reported in the May issue as planning to construct at The Dalles, Ore., at an expenditure of approximately $500,000, has been authorized and a contract for the grading let to Grant Smith & Company, Portland, Ore., pursuant to the company's plan to push the work to an early completion and store ties in the near future. The company's plans relative to carrying out extensive improvements to its store department facilities at Pocatello, Idaho, Rawlins, Wyo., and Grand Island, and at Omaha, Nebraska, as reported in the May issue, have advanced to the point of its installing a gantry crane on the 1000-ft. runway at Pocatello and expecting to start in the near future the construction of a 175-ft. addition to the store house at that point as well as a small storage cellar. The 7½-mile extension of the Homedale branch of the Oregon Short Line, reported in the May issue, as having been authorized by the Interstate Commerce Commission, is now under construction and will be completed this season. The company expects to start in the near future and complete this season the construction of the Delta-Fillmore branch of the Los Angeles and Salt Lake, but does not contemplate undertaking this year the construction of the proposed terminal facilities at Los Angeles for which property has been acquired as reported in the May issue.

**The Wabash** has awarded a contract to the C. W. Gindle Co., Chicago. for the construction of a reclamation plant at Decatur, Ill., this building to be of structural steel and brick, 145 ft. long and 35 ft. wide, with a 17 ft. clearance below the roof trusses.

**The Western Maryland** has awarded a contract to the M. A. Long Company, Baltimore, for the erection of a 100 ft. by 300 ft. Mallet locomotive repair shop at Port Covington, Baltimore. The shop will be fully equipped with cranes and other machinery.

**The Western Pacific** has obtained authority from the War Department to reconstruct its drawbridge across the San Joaquin river about 14 miles south of Stockton, Cal., and has notified the public of its intention to close navigation some time during the period from July 15 to January 1 for the purpose of undertaking this work.

**The Wichita Falls & Oklahoma** has obtained authority from the Interstate Commerce Commission and will undertaken in the near future the construction of an extension of its line north from Byers, Tex., a distance of 13.3 miles, to Waurika, Okla., where a connection will be made with the Chicago, Rock Island & Pacific to provide a shorter route for traffic into that section of the country tributary to Wichita Falls.

**The Yazoo & Mississippi Valley** received bids during the month for the raising of its freight house at Vicksburg, Miss., including some filling and the placing of concrete team pavements, the total work to cost approximately $30,000.

## Epuipment and Supplies

**The Alabama & Vicksburg** has ordered 190 tons of steel from the American Bridge Company for a bridge at Vicksburg, Miss.

**The Chicago, Rock Island & Pacific** has placed an order with the Rail Joint Company for 10,000, 100 per cent joints.

**The Michigan Central** closed bids June 30 for the fabrication, delivery and erection of the necessary structural steel, including castings, rollers, railings, etc., for its proposed 640 ft. steel arch and approaches aggregating approximately 7,500 tons, to be constructed over the Niagara river between the city of Niagara Falls, Ont., and Niagara Falls, N. Y.

**The Missouri, Kansas & Texas** has ordered 800,000 tie plates, 300,000 of which were to be for 66-lb. rail and 500,000 for 85 to 90-lb. rail, from the Railroad Supply Company, Chicago.

**The Missouri Pacific** is inquiring for 2,500 kegs of heat treated track bolts.

**The Norfolk & Western** is inquiring for about 3,000 tons of plates, shapes and bars.

**The Pennsylvania** is inquiring for 100,000 tie plates for 100-lb. rails.

**The St. Louis & San Francisco** made inquiry during the month for 300 tons of structural steel.

**The Seaboard Air Line** has ordered 3,000 tons of rail from the Tennessee Coal, Iron & Railroad Co.

**The Siam State Railways** will receive bids until October 1 for 35 bridge spans of various types with a total length of 1,485 meters, the specifications for which may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C.

# Supply Trade News

## General

**The Northwest Engineering Company,** Green Bay, Wis., manufacturer of crawler trains and draglines, has moved its general sales offices to 1220 Steger building, Chicago. **W. W. Mutter,** vice-president, is in charge of this office.

**The American Bridge Company,** New York, has moved its vice-president's, chief engineer's, eastern division contracting, and treasury departments to 71 Broadway. The eastern division engineering, traffic department and eastern division sub-contract departments will remain at 30 Church street.

**The Black & Decker Manufacturing Company,** Baltimore, Md., has established a new Detroit office in the General Motors building in that city. **C. G. Odell,** assistant to the president of this company, will make his headquarters at this office, which will also be headquarters for the local Detroit representative.

**The E. H. Welker Company, Inc.,** Detroit, Mich., has been appointed to represent the **George Oldham & Son Company,** Baltimore, Md., in the state of Michigan and the city of Toledo, Ohio, with **J. A. Meredith** representing the company in the Pittsburgh district with office at 2138 Oliver building. Both the Detroit and Pittsburgh offices will be factory branches and will carry in stock a complete line of the company's pneumatic equipment.

**The Pittsburgh Testing Laboratory,** Pittsburgh, Pa., has appointed **Harry M. Wey** manager of its Chicago district with offices at 1560 Monadnock Block, and has opened a sales office, with a complete inspection bureau, at 1864 Railway Exchange building, St. Louis, Mo., of which **Col. N. C. Hoyles** has been appointed district manager. Col. Hoyles is a graduate of Queens University, and took a post-graduate course at the University of Toronto. In 1908 he entered the service of this company as an inspector at its Birmingham office and in 1912 was promoted to manager of that office. Two years later he was transferred to the Vancouver office; and at the breaking out of the war, he entered the service of the Canadian Army, serving with the British Pioneer Engineers Corps in France. He received decorations from both the French and British governments, and upon his release from the Army in 1919, he was appointed assistant sales manager at Cleveland. Consecutively since that time he has been assistant sales manager at New York and manager at Cincinnati, until his appointment to the new position above mentioned.

Mr. Wey, who has been appointed manager of the Chicago district, entered the service of the Pennsylvania in 1900 in the office of the superintendent of motive power at Columbus, Ohio, and later served in the motive power departments of the Illinois Central and the Atchison, Topeka & Santa Fe. He was employed in the mechanical department of the Pennsylvania, Lines west of Pittsburgh, again from 1905 until 1909 when he entered the sales department of the U. S. Metallic Packing Company.

## Personal

**A. L. Pearson,** secretary of **Mudge & Co.,** Chicago, has been appointed assistant to the president in addition to his secretarial duties.

**Joseph Maycock,** for more than 20 years a railway representative of Pratt & Lambert, Inc., Buffalo, N. Y., died at his home in that city on June 15. Mr. Maycock was formerly master painter of the Erie.

**J. S. O'Connor,** Standard Supply Company, Beatty Building, Houston, Texas, has been appointed Texas agent for the **Track Specialties Company** and **Walter R. Pflasterer** has been appointed agent with office at 527 Manhattan building, Chicago.

**J. W. McCabe** has been appointed manager of the St. Louis branch of the Chicago Pneumatic Tool Company. Mr. McCabe has been connected with that company for 20 years and has recently returned from a three years' business trip around the world.

**M. A. Evans** has opened an office at 1416 Lytton Bldg., Chicago, to act as a manufacturers' agent in the handling of various railway supplies. Mr. Evans has been in the railway supply business for 12 years, the last six of which were spent in the service of the Buda Company.

**Philip L. Maury,** whose election as a vice-president of the **Detroit Graphite Company** with headquarters at Detroit, Mich., was announced in the June issue, will have direct charge of all activities of the company pertaining to its paint and varnish business with railroads. Mr. Maury was born in Denver, Colo., on October 5, 1884. After leaving school he entered the paint business and has been connected with that industry ever since, having served for many years with the Sherwin-Williams Company as manager of railway and industrial sales, which position he leaves to take up his new duties with the Detroit Graphite Company. During the war he was in charge of the government activities of the Sherwin-Williams Company and was closely identified with the work of the War Service Committee of the Paint Manufacturers' Association.

P. L. Maury

**Frank Phalen,** manager of sales of the New York district for the Republic Iron & Steel Co., for the past 15 years, has resigned to associate himself with his brother, Charles G. Phalen, in the firm of **Phalen & Co.,** 342 Madison avenue, New York City. This firm handles railway equipment and specialties, also iron and steel products.

**John F. Schurch,** vice-president of the T. H. Symington Company, with office at St. Paul, Minn., has relinquished his connection with that company to become vice-president of **Manning, Maxwell & Moore, Inc.,** New York. He will be in charge of sales in the middle west and west, with headquarters at Chicago, 27-29 North Jefferson street. Mr. Schurch was graduated from the University of Minnesota in 1893. He entered the service of the Minneapolis, St. Paul & Sault Ste. Marie the same year, serving consecutively in the office of the auditor and of the general superintendent and in the transportation department, resigning in 1905 after having attained the position of chief clerk to the vice-president. From 1905 until 1914 he was associated with the Railway Materials Company of Chicago. In February, 1914, he was elected vice-president of the Damascus Brake Beam Company with office in Cleveland, Ohio, and in June, 1914 was elected president of the same company, which position he resigned the same year and was elected vice-president in executive charge under President T. H. Symington, of the Symington Company.

J. F. Schurch

**Joseph H. Perry, Jr.,** has been appointed Philadelphia representative of the **Edgewater Steel Company,** Pittsburgh, Pa., with offices in the Finance Building. Mr. Perry was connected with the engineering department of the Pennsylvania at Pittsburgh for a number of years. M. Roy Jackson, formerly vice-president in charge of the Philadelphia office, has resigned.

**The Dressel Railway Lamp & Signal Company,** Arlington, N. J., has been incorporated with **A. D. Hobbie,** president and treasurer, **F. Hallett Lovell, Jr.,** vice-president, **F. W. Dressel,** vice-president, and **L. L. Pollak,** secretary. The new company succeeds the Dressel Manufacturing Corporation, formerly known as the Dressel Railway Lamp Works, New York City, originally established in 1882, with factory formerly located at 3860-80 Park avenue, New York City. All the officers of the new company have for a long time been identified with the railroad lighting and signal field. Increased facilities and equipment have been acquired at the new plant located at Arlington. The company recently developed and made improvements in electric headlights, switch and signal lamps and intends to bring out in addition a number of new devices. A. D. Hobbie is also vice-president and general manager of F. H. Lovell & Co., Arlington. He has been active in the railroad field for over 20 years. F. Hallett Lovell, Jr., is president and treasurer of F. H. Lovell & Co., and was president of the Klaxon Company until it was taken over by the General Motors Company. F. W. Dressel has a long record as a lighting expert in signal and maintenance of way departments and was for a number of years president of the Dressel Lamp Works. L. L. Pollak has been for a number of years production manager of F. H. Lovell & Co.

A. D. Hobbie

F. W. Dressel

**Wesley W. Burden,** formerly with the Bird-Archer Company as chief mechanical engineer and assistant to the president, has resigned to become vice-president and treasurer of the **Wilbur G. Hudson Corporation,** engineers and constructors, with offices at 50 Church street, New York. This company specializes in coal, coke, ash, and ore handling systems, steel, timber and reinforced concrete structures, railroad shops, roundhouses, terminals, and railroad coaling stations.

**James I. Vincent** has been appointed eastern representative of the **Chicago Bascule Bridge Company** with offices at 30 Church street, New York. Mr. Vincent was graduated from the University of Michigan in 1896, and spent several years with bridge fabricating companies and railroads. In 1903 he joined the Scherzer Rolling Lift Bridge Company, and from 1905 to 1912 he was in charge of its New York office except during 1908, when he was abroad in charge of the construction of a bridge in Burmah, and in obtaining orders in Europe. From 1912 until very recently Mr. Vincent was eastern representative of the Strauss Bascule Bridge Company in charge of the New York office.

**W. Woodward Williams,** vice-president of the Pittsburgh Gage & Supply Company, has resigned to become vice-president of the Titan Iron & Steel Company, Inc., Newark, N. J., which will manufacture mechanically puddled wrought iron. Mr. Williams entered the iron and steel industry immediately upon his graduation from Harvard University in 1905, as an employee in the mills of the Carnegie Steel Company at Pittsburgh, Duquesne, and Youngstown. Six years later, he entered the sales department of the Bourne-Fuller Company of Cleveland, where he served in various capacities, including that of manager of the Pittsburgh office until January, 1904, when he became general manager of sales of the A. M. Byers Company, Pittsburgh, a company in which he was subsequently made general manager. Relinquishing his connection with the A. M. Byers Company in August, 1919, he became general manager of the Reading Iron Company, and continued as general manager and later as vice-president in charge of sales and operations until September, 1920, when he became associated with the Pittsburgh Gage & Supply Company, the vice-presidency of which he resigned on May 31, to become vice-president of the Titan Iron & Steel Company, Inc.

W. Woodward Williams

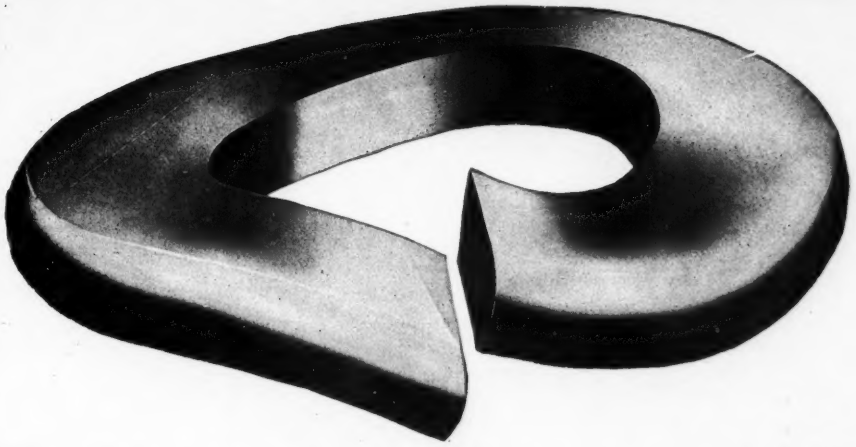
## Trade Publications

**Floodlights.**—A four-page bulletin has been issued by the Pyle-National Company, Chicago, which is devoted to a description of the construction and application of its several types of flood and search lights, this bulletin containing a complete list of parts and enumerating the uses to which each light is adapted.

**Sheet Packing.**—The John-Pratt Company, Hartford, Conn., has issued a 46-page booklet cataloging its line of packing for railway uses. This booklet, constituting the first catalog issued by this company which deals exclusively with "Vulcabeston" products, contains illustrations, descriptive information and prices on packing for cylinder heads, pump valves, etc.

**Air Compressors.**—The Sullivan Machinery Company, Chicago, has issued two new bulletins, No. 77-D and 70-X, respectively, which illustrate and describe the features and application of the Sullivan portable air compressors and the Sullivan compressed air spader, the latter a tool developed to combine the features of the ordinary pick and the shovel in work where the latter tools are not well adapted. In bulletin 77-D describing the portable air compressors, space is also given to describing several types of rock drill and similar tools.

**Cut Ash Handling Costs.**—The Conveyors Corporation of America, Chicago, has issued an illustrated booklet entitled, Cut Ash Handling Costs, which should prove of interest to the executive concerned with the reduction of boiler room overhead. The booklet is an exposition of the steam jet conveyor method of ash handling and contains a description of the conveyor and its method of operation. It also gives a list of guarantees on the performance of that company's steam ash conveyor, among which are the cost per ton of ash handled; the cost of repairs per ton of ash handled; the non-packing of ashes in the ash storage tank; the absence of dust at discharge, and the non-freezing of ashes.



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